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Redesigning a Tier 3 Weight Management Service through the use of a mobile application

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Background

The weight management service at Musgrove Park Hospital (MPH) receives around 30 new referrals a month which are currently triaged to be seen jointly by a physician and dietitian at the same visit, with a referral to treatment time (RTT) of 28–32 weeks. The number of patients the service can see each month is limited by incompatible work patterns and lack of clinic space. We are receiving increasing numbers of referrals for complications of bariatric surgery such as hypoglycaemia, nutritional deficiencies and weight regain in addition to referrals for urgent weight loss to allow treatment of endometrial cancer. A new triaging system is required to (1) reduce the RTT to <18 weeks and (2) allow alternative treatment pathways.

Methods

We worked with the MPH Improvement Team and University College London (UCL) Computer Science students to devise a mobile application that would allow patients to complete a questionnaire that would triage them directly to three different treatment pathways. Patients would also be able to enter anthropometric and clinical data that could be tracked via an administration website and used for audit purposes. Piloted questions were provided to the students to allow appropriate triage to an initial group session and then either an urgent or routine outpatient appointment with a physician and dietitian, or with a dietitian or physician alone.

Results

The students have designed a mobile application compatible with iOS and Android devices that the patients would only be able download following a referral by their GP. After agreeing to the terms and conditions, they would then complete the questionnaire after their initial group session. Despite some setbacks the app will be ready to hand over to the Trust in June 2019 with a view to being ready to use in August 2019.

Conclusions

We are hopeful that the app will reduce the RTT of weight management referrals from 32 weeks to 18 weeks by identifying patients that only require dietetic input freeing consultant time to allow earlier review of patients with medical complications thus improving and standardising care.

Keywords

mobile application, weight management service

Disclosures

None.

'New to Research' Best Abstract Award
A02

Exploring engagement with the food provisioning in areas of deprivation: Findings from three ethnographic case studies

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Introduction

There is increasing policy and academic interest in the role of the food environment in influencing rates of obesity, particularly in areas of deprivation. However although we have developed considerable insights into how to measure the 'healthiness' of retail environments, and assess access and availability to healthy food, less is understood about how individuals and families experience and engage with their environments.

Methods

Focused ethnographic case studies were conducted in three locations in England: Great Yarmouth, Stoke-on-Trent, and the London Borough of Lewisham. Five qualitative methods were used, comprising engagement with community groups, semi-structured interviews, photo-elicitation, shop-along interviews, and participatory workshops. All participants across the case study sites ($N = 60$) resided in neighbourhoods that scored 1 or 2 on the Standard Index of Multiple Deprivation and experienced rates of childhood obesity that were higher than the England average.

Results

Family life was described as both routinised and complex, and shaped how people engaged in the food environment. While most participants hoped to provide nutritious meals for their children, they identified numerous barriers which prevented them from achieving this in practice. Participants highlighted financial insecurity, challenges accessing supermarkets, deals for HFSS foods, the comparative expense of nutritious foods, the time required to prepare meals, and pressure from 'fussy' children. Importantly, the food environment also served non-food needs. For example cheap HFSS foods offered a source of treats, while the presence of takeaways and fast-food outlets provided opportunities for meaningful shared family activities.

Conclusion

The food environment does not exist in isolation from the varying contexts of individuals' lives. Therefore, efforts to address obesity through altering food environments must take people's understandings and expectations into account. Policies and interventions may only be effective if they meet people's broader, non-food needs, at the same time as increasing the physical, financial, and cultural accessibility of healthy foods.

Disclosures

There are no disclosures to report.

Oral Communications

OC1.1

The Impact of Bariatric surgery on incident Cardiovascular disease in the UK: A population-based matched controlled cohort study

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Background

Cohort studies showed that bariatric surgery may reduce cardiovascular disease (CVD) incidence, but real-world data from the UK in that regards are limited. Hence, we conducted a population-based study examining the impact of bariatric surgery on incident CVD.

Methods

A retrospective cohort matched-controlled study of adults (18–75 years) who had bariatric surgery (Gastric band (GB), sleeve gastrectomy/gastroplasty (SG), gastric bypass (RYGB) and duodenal switch) between 1/1/1990 and 31/1/2018. We utilised The Health Improvement Network (THIN), a validated and representative primary care electronic database. Each exposed patient was matched to 2 controls for age, gender and BMI. CVD was defined as ischemic heart disease (IHD), heart failure (HF), or cerebrovascular disease. Patients with gastric cancer or CVD at baseline were excluded. We conducted Cox regression to analyse the time to event using STATA version15.

Result

The study included 4922 exposed and 9484 control participants, mean age (s.D.) 44.8 (10.4) years, 82.04% were female, 19.9% had diabetes. The median follow-up was 3.83 years (IQR 1.72–6.34 years). Incident CVD developed in 87 vs 230 patients of the exposed vs. control groups (incident rate 4.3 vs 5.58 per 1000-persons-year respectively). After adjusting for age, gender, baseline BMI, diabetes status, hypertension, smoking, alcohol intake, ethnicity and social deprivation, the adj HR for incident CVD was 0.80 (95%CI 0.62 to 1.02, $P = 0.074$). Examining individual surgical procedure showed that RYGB was associated with reduction in incident CVD with adj HR of 0.53 (95% CI 0.34–0.81, $P = 0.003$) mainly driven by reduction in incident HF; while GB and SG had neutral/modest non-significant effects. There was statistically non-significant increased risk of stroke noted in GB exposed vs control (1.67, 0.94 to 2.96; $P = 0.08$).

Conclusions

Bariatric surgery was associated with reduction in incident CVD mainly HF. The observed possible increased risk of stroke in GB requires further examinations.

OC1.2

Listening to the unheard voice: a qualitative exploration of the views of men working in routine manual occupations and their general practitioners about body weight, health and weight management programmes

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Background

Men are underrepresented in weight management programmes despite more men having increased health risk due to elevated body mass index. Gender sensitised weight management programmes have been trialled in an attempt to encourage more men to access support. Despite successes little is known about the views of men that have never attended any form of structured weight management programme. The aim of this research was to increase understanding of the view that men who have never attended weight management programmes have towards body weight, health and weight management programmes.

Methods

Participants were recruited purposefully at their place of work. Semi-structured interviews were conducted with 16 adult men with a BMI>25 who had never participated in a structured weight management programme and were employed in routine manual occupations. Interviews were analysed using an inductive thematic analysis approach. Following early data analysis, GPs were identified as having influence on men's behaviour regarding weight management.

Subsequently, 10 GP's were recruited and interviewed with findings from the two groups compared and contrasted.

Results

Men have high levels of body consciousness, value guidance from GP's, have high levels of agency towards lifestyle choices and wish to preserve their masculinity which is a barrier to attending weight management programmes. GP's did not feel equipped to deal with obesity sufficiently in primary care and held stigmatised views of men and their needs regarding body weight and weight management.

Conclusion

Failure to consider the needs of men in weight management programmes will continue to lead to low participation. Improving health literacy at population level, gender sensitisation of resources, preservation of masculinity and providing men with opportunity to follow self-directed weight management programmes is the most likely way to increase participation. GP's need empowering to feel confident at addressing weight management in men.

Keywords

Men, body weight, programmes, general practitioners, masculinity, qualitative

OC1.3

Pregnancy after bariatric surgery: a case-control study of maternal risk factors for small for gestational age babies in the AURORA dataset

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Background

Small-for-gestational-age (SGA) is defined as a baby born <10th percentile for birth weight, age, and sex. Women with previous bariatric surgery have >2-fold risk of having a SGA baby, especially following malabsorptive surgery such as Roux-en-Y gastric bypass (RYGB). Babies born SGA are at an increased risk for morbidity and mortality; however, adverse outcomes are significantly improved when SGA identification occurs antenatally. This study aimed to investigate maternal risk factors for delivering an SGA baby after bariatric surgery.

Methods

This case-control study includes babies born from the AURORA (bAriatric sUrgery Registration in wOmen of Reproductive Age) cohort study. AURORA is a multi-centre prospective cohort study of women aged 18–45 in Belgium. Women who already have had or will undergo bariatric surgery are followed until six months after a subsequent pregnancy. Maternal risk factors investigated included both modifiable factors and clinical indicators, such as gestational weight gain (GWG), type of surgery, and surgery-to-conception interval. Multiple logistic regression was carried out adjusting for maternal age at conception.

Results

We included 25 SGA babies and 97 appropriate-for-gestational-age (AGA between 10th–90th percentiles) babies defined using birth weight, gestational age, sex, and parity. GWG was lower in SGA mothers (9.8 vs 13 kg) and was associated with decreased odds of SGA per kg of GWG (OR 0.92 95% CI 0.85–0.99). After grouping women according to Institute of Medicine GWG guidelines, nearly half of SGA mothers fell into the 'inadequate' category (44% SGA vs 17% AGA) whereas more than half of AGA mothers fell into the 'excessive' group (28% SGA vs 53% AGA). Pre-pregnancy BMI was lower in SGA mothers compared with AGA mothers (26 vs 29 kg/m^2), and weight loss after surgery was higher (46 vs 39 kg). Fewer mothers had gestational diabetes in the SGA group (16% vs 25%).

Conclusions

Maternal GWG appears to be an important factor for SGA among women who have had bariatric surgery prior to pregnancy. Further research is required to explore appropriate GWG in this population.

Keywords

Bariatric surgery, pregnancy, fetal growth, GWG

OC1.4

A systematic review of the evidence for interventions to increase levels of physical activity in patients following weight loss surgery

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Background
Weight loss surgery [WLS] is effective at inducing significant weight loss and improving associated complications such as type 2 diabetes. However, weight regain and re-occurrence of these conditions can occur. Consequently there is increasing focus on how to optimise patient outcomes with emerging evidence that those who increase their levels of physical activity [PA] have better clinical and patient-centred outcomes. The aim of this review was to synthesise the evidence for interventions which aim to increase PA in patients who have had WLS and to identify promising behaviour change techniques [BCT].
Methods
Four databases were searched (Medline, CINAHL, Scopus and PsychINFO). Studies published in English, of any design were included if they evaluated a PA intervention, with PA measured at baseline and at least once after WLS. Titles and abstracts were screened by JJ and a 10% random sample by VS. JJ and VS independently screened all full text articles and conducted data extraction. BCTs were coded independently by JJ and WH using the BCT Taxonomy v1.
Results
The search resulted in 3,078 original articles; 42 were selected for full text screening, and seven were included. Two interventions began pre-operatively and five post-operatively; the earliest intervention began 34.6 weeks before surgery and the latest 19.3 (5) months after. Intervention duration ranged between six weeks and three years. All interventions were delivered face-to-face, either on a one-to-one basis, in groups or a combination thereof ($n=3$, $n=2$, $n=2$ respectively), with supervised exercise in five studies. Common BCTs identified were goal setting (behaviour), graded tasks, monitoring behaviour without feedback, instruction on how to do the behaviour and behaviour practice/rehearsal. There was evidence of a positive effect on PA in four of the studies; this included the intervention with the shortest duration, which also had the greatest number of BCTs ($n=19$).
Conclusion
This review has identified evidence for interventions to increase PA after WLS, and suggests that intervention duration is not critical for effect. However, more research is needed to identify the necessary components of effective interventions, which should be evaluated for their clinical utility.
Keywords
Physical activity, weight loss surgery, behaviour change
Disclosures
Nil.

OC1.5

Cognitive and behavioural strategies employed to overcome 'relapse' among weight loss maintainers and regainers: a qualitative study

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Background
While many behavioural weight management programmes are effective in the short-term, in the context of a complex obesogenic environment, post-programme weight regain is common. Overcoming 'relapses' has been highlighted as an important phenomenon in weight-loss maintenance, but research on how this is done is sparse. By comparing strategies employed by those who had regained or maintained weight loss, we explored this phenomenon and identified effective cognitive and behavioural strategies for overcoming relapse.
Methods
We conducted face-to-face semi-structured interviews with 26 participants (58% female) recruited from 5-year follow up of the WRAP trial (evaluation of a commercial weight-loss programme). Participants who had lost >5% baseline weight during the active intervention (years 0–1) were purposively sampled for an even split of 5-year weight trajectories (50% 'regainers', 50% 'maintainers') and a range of demographic characteristics. Questions focused on post-programme experiences, physical activity, diet, social support and mood. Interviews were audio-recorded and transcribed verbatim. We analysed interviews using a constant comparative method, against themes of an existing model of weight-loss maintenance. Data were managed using NVivo. Two researchers independently coded all interviews with continuous discussion and a reflective log. A patient representative read a subset of transcripts, highlighted important themes, and assisted with interpretation of findings. Differences in strategies between regainers and maintainers were compared.
Results
Maintainers used more self-regulation techniques such as monitoring eating behaviour, swapping with healthier alternatives, managing impulses using distraction techniques, and compensating for lapses, usually by reducing 'sweet foods'. Maintainers anticipated potential lapses and made plans to compensate for 'indulgences' on social occasions. Regainers did not have such a plan, and appeared to have difficulty navigating interpersonal relationships in relation to food. Our findings were broadly in line with the weight-loss maintenance model.
Conclusion
Few studies have examined weight maintenance strategies over 5 years, and the comparison between maintainers and regainers provides valuable insights. Maintainers appeared to have a plan to employ more flexible self-regulation techniques to get back on track after lapses in comparison to regainers, suggesting these strategies should be emphasised in future programmes to ensure successful long-term outcomes.
Keywords
Qualitative, weight-loss maintenance, strategies
Disclosures
None.

OC2.1

Critical reasoning and advertising in children and adolescents: a narrative synthesis from a systematic review

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Background
There is considerable interest in tightening food and drink advertising restrictions to address childhood obesity. However, regulations often focus on protecting children aged <12 years, with the assumption that older children are cognitively capable of understanding advertising. This review aims to systematically examine whether advertising influences children and adolescents' critical reasoning in relation to health behaviours.
Methods
Inclusion criteria were broad (>5 years to <18 years; any advertising exposure; a measure of 'judgement' as an outcome; experimental, intervention, cross-sectional, longitudinal, and qualitative methodologies; with no restrictions on language or date). The following databases were searched: Ovid Medline, Cochrane, Scopus, Psych Info, ProQuest (ASSIA), Web of Science (Social Science and emerging sources), Social Policy and Practice, and Child Development and Adolescent Studies. Articles were double screened on title and abstract and EPPI-Reviewer 4 systematic review software used to manage the review and apply machine learning to screening. This narrative focused on contemporary studies (2010 onwards) with an administered exposure which measured understanding or attitudinal outcomes.
Results
A total of 7467 articles were identified with 505 potentially relevant on title and abstract. Of these, 52 articles were published from 2010, included an experimental design and reported understanding or attitudinal outcomes. The majority had a moderate to high risk of bias. Exposures were predominantly adverts for food and from television. Understanding of advertising and recognition of persuasive intent increased with age, but there was no clear evidence that this reached adult levels by 12 years. Children seemed more perceptive about subtle messaging as they got older, with more novel advertising formats appearing particularly difficult for younger children to understand. Advertising produced more positive attitudes in children of all ages but links between understanding and attitudes were unclear.
Conclusions
Understanding of advertising increased across childhood and into adolescence but there was no evidence of a ceiling effect at age 12 years. Advertising brought about more positive attitudes in children of all of ages. Therefore, there appeared potential for younger children in particular to be manipulated by advertising but effects on adolescents require further exploration.

OC2.2

Impact of health warning labels on snack selection: two online studies

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Background
Excessive consumption of energy-dense food increases the risk of obesity, which in turn increases the risk of non-communicable diseases, including heart disease, type 2 diabetes and most non-smoking related cancers. Health warning labels (HWLs) that communicate the adverse health consequences of excess calorie consumption could reduce intake of energy-dense foods. We aimed to identify the most promising HWLs for reducing intake of energy-dense snacks in two online studies for subsequent testing in real-world settings.
Methods
Study 1: A between-subjects design with 18 different image-and-text HWL conditions. Participants ($N=4618$) were randomly allocated to view a food product with one HWL. HWLs rated as the most potent (based on high negative emotional arousal and low desire to consume the product) were selected for Study 2.
Study 2: A between-subjects, 3 (HWL: text only, image-and-text, no label) $\times$ 2 (calorie information; no calorie information), factorial experimental design. Participants ($N=4134$) were randomised to view a selection of low and high energy-dense snacks with one of five label types or no label. The primary outcome was the proportion of participants selecting energy-dense snacks in a hypothetical vending machine task.
Results
Study 1: HWLs illustrating bowel cancer, heart disease and type 2 diabetes were rated as the most potent and were selected for Study 2.
Study 2: Preliminary results show the proportion of participants selecting an energy-dense snack was reduced in all HWL conditions, relative to the control condition: (Image-and-text (37% selected energy-dense snack); Image-and-text with calories (38%); Text-only (48%); Text-only with calories (44%); Calories only (54%), Control (59%)). Participants were least likely to select an energy-dense snack in the image-and-text HWL condition and most likely in the control condition.
Conclusions
HWLs – particularly those including an image and text - have the potential to reduce selection of energy-dense snacks. Their impact on selection and consumption in real-world settings awaits testing.
Keywords
Health warning labels, pictorial labels, graphic warnings, snacks, food, choice architecture
Disclosures
The study investigators have no known conflicts of interest to declare.
DOI: 10.1530/obabs.1.OC2.2

OC2.3

Ethnicity, migration, and weight misperception: a Born in Bradford study

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Background
Weight perception may differ by ethnicity but has not been examined among migrants to the United Kingdom (UK). Similarly, studies have not assessed whether a figure rating scale (FRS) or perceived weight question (PWQ) are more accurate in evaluating body size perception.
Methods
At 24 months postpartum, women with singleton pregnancies ($n=1201$) within the Born in Bradford cohort (Bradford, UK) completed the nine-item Stunkard FRS and a 7-category PWQ ranging from 'very underweight' to 'very overweight'. Data from both scales were condensed to four weight categories representing the World Health Organisation cut-offs. Weighted kappa statistics were applied to assess agreement between measured weight categories with the FRS and PWQ. χ^2 tests and Fisher's exact tests were used to assess differences in misperception by ethnicity and migration and logistic regression was used to assess odds of underestimation.
Results
Thirty percent of white British and 23% of Pakistani-origin women had obesity, with no differences by migration status. Compared to white British women, underestimation was more frequent for Pakistani-origin women, particularly those foreign-born, with higher prevalence of underestimation with the PWQ (18% vs 10%; $P<0.001$) than FRS (14% vs 6%; $P<0.001$). Agreement between measured and perceived weight categories were similar when using the FRS or PWQ for white British women (FRS: κ (95%CI): 0.612 (0.56, 0.65); PWQ: 0.614 (0.55, 0.68)). Overall agreement was lower for Pakistani-origin women with higher accuracy for the FRS (0.583 (0.52, 0.63) vs PWQ: 0.472 (0.40, 0.54)). Compared to white British women, odds of underestimation were 155% higher among Pakistani-origin women when using the FRS compared to 114% with the PWQ.
Conclusions
Ethnic differences in weight misperception may influence how women regard the applicability of public health messaging on weight. The measures used to assess misperception can influence the findings, suggesting visual scales rather than questions should be used to assess weight perception.
Keywords
Ethnicity, migration, obesity, misperception
Disclosures
None.
DOI: 10.1530/obabs.1.OC2.3

OC2.4

Does exposure to socially endorsed images of food on social media affect our consumption of low and high energy dense foods?

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Background
Laboratory studies have demonstrated that exposure to social norm messages conveying the typical eating behaviour of others, can nudge participants to consume more low energy-dense (LED) and fewer high energy-dense (HED) snacks, both of which are desirable from an obesity perspective. In the digital age, it is plausible that social norms conveying what others are eating, and approve of eating, are communicated via social media, however, this has not been tested experimentally. Therefore, this study aimed to investigate the acute effect of socially endorsed social media posts on participants' eating behaviour.
Methods
Healthy women students ($n=168$; mean age$=20.9$; mean BMI$=23.3$) were assigned to either a HED, LED or control condition, where they viewed three types of images (HED foods, LED foods and interior design as control), but only one type was socially endorsed (e.g. in the control condition, only the interior design images were socially endorsed). Participants completed several questionnaires and were also provided a snack buffet of grapes and cookies.
Results
One-way ANOVA revealed a significant main effect of condition on participants' relative consumption of grapes (percentage of grapes consumed out of total food intake), for both grams ($P=.03$) and calories consumed ($P=.03$). Follow-up t-tests revealed that participants chose a larger proportion of grapes in both grams and calories in the LED condition vs HED condition (all $Ps<.05$), and a larger proportion of calories from grapes in the LED compared to control condition ($P<.05$).
Conclusions
These findings suggest that exposure to socially endorsed images of LED food on social media could nudge people to consume more of, and derive more calories from these foods in place of HED foods. Further research is now required to

investigate whether exposure to socially endorsed images of LED foods can produce similar effects with individuals who are obese.

OC2.5

A Social Network Analysis of the #SugarTax debate on Twitter

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Background
Sugar and soft drink taxes have been implemented in over 40 locations globally. This includes the UK's Soft Drink Industry Levy (SDIL) which was implemented on 6th April 2018 to reduce sugar consumption and improve health. Tax implementation is highly debated on social media. This study aimed to explore the stakeholder networks involved in the debate surrounding the SDIL on Twitter.
Methods
Social network analysis (SNA) of tweets posted between August 2017 and May 2019 containing the search term 'sugar tax', (or those posted in reply to, or retweeting posts containing the term) was conducted. Network graphs were developed using NodeXL to investigate network structures, identify clusters and to assess the path distances between actors. A 20% subsample of tweets were randomly selected and analysed for content, sentiment and themes.
Results
Across the sample period 5366 tweets were posted by 1883 users. SNA revealed the sugar tax debate on Twitter is disperse, with contributors from 238 different groups including dental health organisations, government bodies and the soft drink industry. Analysis of the tweet subsample revealed users were sharing information from a variety of sources and users. The majority of tweets (52%, n=115) were negative in sentiment, whilst only 17% (n=37) were positive. Influential actors were identified based on position within the network, the number of ties to other actors, and the number of tweets posted. Public health professionals and industry groups were influential as they were strategically located and had numerous weak ties to other actors.
Conclusion
Unlike theoretical descriptions of networks of divisive debates which have a polarised structure, SNA here revealed that the #Sugartax debate on Twitter had a dispersed network. This may be due to the greater number of actors involved and range of information sources being shared. The diverse debates taking place were evidenced by the variety of themes identified. Influential actors were characterised by having numerous weak ties to other actors and being prolific posters of tweets. Advocates could apply the findings to improve their understanding of policy debates on Twitter and improve their attempts to shape debates for example through developing numerous weak ties.

OC3.1

Impact of exercise training on food reward and eating behaviour traits that promote overconsumption in individuals with overweight and obesity

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Background
In addition to effects on body weight and composition, it is becoming apparent that exercise training improves markers of appetite control. Several studies have focused on homeostatic appetite responses to exercise training (e.g. appetite-related peptides, gastric emptying, satiety and food intake), but little is known on its effects on food reward and susceptibility to overeating.
Methods
This study examined changes in food reward and eating behaviour traits after a supervised 12-week exercise intervention (2500 kcal/week) in inactive individuals with overweight and obesity (n=46, 30 females/16 males; BMI=30.6 ± 3.8 kg/m^2; age=43.2 ± 7.5 years) compared to non-exercising controls (n=15; 9 females/6 males; BMI=31.4 ± 3.7 kg/m^2; age=41.4 ± 10.7 years). Liking and wanting for high-fat relative to low-fat foods (Leeds Food Preference Questionnaire) was assessed before and after consumption of an isoenergetic high-fat (HFAT) or high-carbohydrate (HCHO) lunch. Psychometric eating behaviour traits were assessed using the Three-Factor Eating Questionnaire and Binge Eating Scale. Body composition was also measured (air displacement plethysmography).
Results
The 12-week intervention produced a mean weight loss of 1.8 kg in Exercisers ($P<0.001$, $\eta p^2=0.27$, 95%CI=-2.6 to -1.0 kg), compared to a weight gain of 1.3 kg in Controls ($P=0.06$, $\eta p^2=0.06$, 95%CI=-0.04 to 2.7 kg). A week by group interaction indicated that wanting decreased from baseline to post-intervention in Exercisers only ($M_\Delta=-4.1$, $P=0.03$, $\eta p^2=0.09$, 95%CI=-7.8 to -0.4), but there were no exercise effects on liking. There was also a week by group interaction for binge eating, which decreased from baseline to post-intervention in Exercisers only ($M_\Delta=-1.5$, $P=0.01$, $\eta p^2=0.11$, 95%CI=-2.7 to -0.4). A small reduction in disinhibition was also apparent in Exercisers ($M_\Delta=-0.7$, $P=0.02$, $\eta p^2=0.10$, 95%CI=-1.3 to -0.1).
Conclusions
This study showed that 12 week of exercise training reduced wanting for high-fat foods and trait characteristics of overeating in inactive individuals with overweight/obesity compared to non-exercising controls. Exercise therefore improves the ability of people to control their eating behaviour.

OC3.2

Obesity and disease severity in people with atrial fibrillation: a community-based cross-sectional survey

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Background
Atrial fibrillation (AF) is the most common sustained cardiac arrhythmia and its incidence is strongly linked with obesity. Weight loss may reduce AF severity in relatively young patients with AF and overweight. However, it is unclear whether symptom severity and AF-related quality of life are associated with obesity in the general population of people with AF.
Methods
Ten general practices in central England identified patients with electrocardiogram-confirmed AF. Each person was asked to complete the validated Atrial Fibrillation Severity Scale (AFSS). The AFSS assessed the AF burden scoring on AF-related symptoms, global well-being, as well as total AF burden measured as a combination of duration, frequency, and severity of an irregular heartbeat. Linear regression examined the association of body mass index (BMI) with AF severity adjusting for age, sex, and comorbidities.
Results
Between October 2018 and May 2019, 881 of 1901 (46%) mailed responses were returned completed. Participants were on average (s.d.) 74 (10) years old, 64% were male, 99% were of white ethnicity. They were taking 5 (3) prescribed medications, had a BMI of 27.5 (5.7) kg/m^2, and 26% were affected by obesity. Sixteen percent reported having never experienced an irregular heartbeat. A 5 kg/m^2 higher BMI was associated with a 0.75 (95%CI: $0.35-1.15$, $P<0.001$) higher symptom score, where 3 points represent a clinically relevant change in state. A 5 kg/m^2 higher BMI was associated with a -0.1 (95%CI: $-0.2-0.0004$, $P=0.07$) lower global wellbeing score. The coefficient of the total AF burden for a 5 kg/m^2 higher BMI was 0.1 (95%CI: $-0.0016-0.6$, $P=0.69$).

Conclusion

BMI was positively associated with AF-related symptom score in the general population of people with AF but not with other constructs of AF. However, the association did not appear to be clinically meaningful. Future research should examine whether excess weight should be addressed in specific subgroups of people with AF for reducing the severity of patient-reported symptoms and improving individuals' quality of life.

Keywords

Atrial fibrillation, obesity, quality of life, cross-sectional

Disclosures

Nothing to disclose.

OC3.4

Abstract unavailable

OC3.3

The associations between lunch type consumed during a school day and UK adolescents' overall diet quality

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Background

Evidence suggests that the diet quality of children consuming school meals tends to be better than that of children consuming packed lunches or food brought from outside school. This study aims to investigate the association between the types of lunch consumed in a school day and diet quality of UK adolescents.

Methods

2118 British adolescents were included from the National Diet and Nutrition Survey (Years 1–8). All participants were aged 11–18 years with valid 3 or 4-day diary records and attended school. The Diet Quality Index for Adolescents (DQI-A) tool was used to assess the adherence of British adolescents to dietary recommendations. The DQI-A consists of three main components; dietary quality (DQc), dietary diversity (DDc) and dietary equilibrium (DEc) which are presented in percentages. The DDc and DEc percentage ranges are 0 –100%, whereas the DQc percentage range is –100 to 100%. The overall DQI-A score ranges from –33 to 100% and a higher DQI-A% score reflects a better quality of diet.

Results

The overall mean DQI-A score for all adolescents was low at 21.0%. Cooked school lunch meals and packed lunches were the most popular lunch type. Adolescents who reported buying lunches from cafés and shops had the lowest DQI-A% score of 14.8%. Adolescents having cooked school meals (reference group) had a higher overall DQI-A% of 21.8%. Diet quality scores of adolescents having packed lunches and takeaway lunches were 1.6% higher (CI =0.1, 3.2; $P = 0.04$) and 8.2% lower (CI=6.2, 10.2; $P < 0.01$) than the reference group respectively, after adjusting for confounders including age, sex and household income. In addition, significant differences were observed between cooked school meal consumers and packed lunches and takeaway consumers for most of the DQI-A components and subcomponents, after adjusting for confounders.

Conclusions

UK adolescents have a low-quality diet and lunch type has an impact on diet quality. Adolescents consuming takeaway lunches from outside the school gates have the lowest DQI-A score. These results confirm the importance of implementing and evaluating regulation policies regarding food outlets around secondary schools as well as improving food choices within school premises.

OC3.5

The impact of weight stigma on healthcare practitioner-patient relationship

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Background

Research exploring the impact of weight stigma in healthcare has typically focused on attitudes towards and impact on patient care. Sparse research has explored weight stigma towards healthcare professionals (HCPs). This study aimed to examine the influence of HCPs weight status on recall of medical advice (RA), and attitudes towards HCPs (AHCP) measures.

Methods

After receiving ethical clearance, this between-subjects study was hosted on Qualtrics[TM]. Four videos were recorded, two with a male actor and two with a female actor. Actors delivered either the NHS weight management advice assuming the role of a dietitian or the NHS stress management advice as a psychologist. We modified the actors' body size using digital compositing, doubling the number of videos. Thus, there were 8 video (conditions) in total; 4 with and 4 without obesity. We hypothesized that participants who viewed the male dietitian or psychologist without obesity would report more positive AHCP and/or recall more advice in contrast to participants who viewed the female dietitian or psychologist with obesity. A total of 237 participants were randomly allocated into conditions, taking the role of patients. They viewed the videos and responded to measures assessing RA, AHCP, attitudes towards people with obesity, and demographic questions. We analysed our data using dummy regression models exploring whether AHCP or amount of RA differs between conditions while controlling for confounding variables.

Results

Before analysis we conducted psychometric evaluation of RA and AHCP measures producing weighted and factor scores respectively. We observed differences between genders and weight status on AHCP measure; however, the effect on RA was negligible. Differences at $P < 0.05$ were observed between the female and male psychologists with obesity (gender); female and male dietitian with obesity (gender); and male dietitian with and without obesity (weight status). The attitudes were more favourable towards female than male HCPs (specifically Compassion and Impression of HCPs) and less favourable towards HCPs without than with obesity (specifically Impression of HCPs).

Conclusions

This study represents one of the first experiments to assess weight stigma towards healthcare professionals, which can impact patient-practitioner relationships and patient compliance.

Keywords

Weight stigma, healthcare, attitudes

Rapid Fire Communications

RFC1.1

Appeal biases for sweet and fatty foods are robust following a single session of transcranial direct current stimulation (tDCS) in a healthy weight population

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Background
Hypo-activation of the dorsolateral prefrontal cortex (DLPFC), evident in adults with obesity, is associated with increased reward response to high-calorie foods. Transcranial direct current stimulation (tDCS) over the DLPFC has been shown to reduce food cravings and consumption, attenuating reward response. Eating behaviour traits may be relevant to tDCS outcomes; previous research has largely failed to consider such effects. The present study examined the effects of tDCS on food reward and craving using a healthy weight control, and is the first to explore implicit and explicit appeal bias for sweet and high-fat foods following tDCS.
Methods
Twenty-one participants (11 female, 24 ± 7 years, 22.8 ± 2.3 kg·m^{-2}) completed two sessions involving randomised and counterbalanced anodal or sham tDCS over the right DLPFC, at 2 milliampere for 20 minutes. Eating behaviour traits were assessed using: Food Craving Questionnaire-Trait, Three Factor Eating Questionnaire, Control of Eating Questionnaire. During sessions, subjective appetite sensations were measured using 100 mm visual analogue scales. Food reward was assessed using the Leeds Food Preference Questionnaire, in-the-moment craving using the Food Craving Questionnaire-State, and food choice motives using the Food Choice Questionnaire. Pearson's correlations were used to determine test-retest reliability of baseline data. Data were compared using analysis of variance (ANOVA) to 0.05 alpha level.
Results
Participants displayed 'healthy' eating behaviour with low trait craving, good craving control, and low Uncontrolled Eating and Emotional Eating scores. Test-retest analysis indicated moderate-to-good reliability of baseline measures ($r = 0.536$–0.955, $P < 0.020$), except for desire to eat ($r = 0.382$, $P = 0.088$). Stimulation had no significant effect on each variable, with fat and taste appeal bias remaining stable (mean difference from baseline 2.20, SD 8.38 AU). Throughout, between-participant variation was large.
Conclusion
Healthy participants with no apparent eating behaviour trait susceptibilities to overconsume did not respond to stimulation, suggesting increasing DLPFC activity using tDCS does not change food reward response in healthy controls. Treatment effects may be seen in individuals with 'problematic' eating behaviour traits (e.g. high trait craving or binge-eating) who are overweight/obese or at risk of weight gain.
Keywords
Brain stimulation, dorsolateral prefrontal cortex, food reward, food craving
Disclosure
The authors declare no conflict of interest.

RFC1.2

Using dietary patterns methods to identify indicators of diet quality in the UK adult population – the development and validation of Brief Diet Quality Assessment Tools (BDQAT)

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Background
In the UK, there are few brief, validated dietary assessment tools available. The purpose of this study was to use dietary patterns methods to identify food groups and sample characteristics that were associated with diet quality to inform the development of a brief, diet quality assessment tool.
Methods
Diet quality was explored using *a priori* and *a posteriori* dietary patterns methods in adults from the UK National Diet and Nutrition Survey ($n = 2083$). Principal Component Analysis of 60 foods was used to derive empirical dietary patterns that were analysed for their associations with sample characteristics and nutrient biomarkers. Backwards elimination regression was conducted with 60 foods and sample characteristics to identify models that were independently predictive of a theory driven, validated, Nutrient-based Diet Quality Score (NDQS). Confirmatory analysis and further exploratory analysis identified the most parsimonious models of diet quality.
Results
Four *a posteriori* dietary patterns, subjectively labelled as 'fruit, vegetables, oily fish, 'snacks, fast food, fizzy drinks', 'meat, potatoes, beer' and 'sugary food,

dairy' explained 13.6% of the dietary variance in the data. Three patterns were clearly associated with nutrient biomarkers in the expected direction. Fourteen foods characterising these patterns were included in a 'diet quality model'. Backwards elimination regression identified a second model of 12 foods and a third model of 9 foods, age and smoking status. Confirmatory analysis showed all models were moderately associated with the NDQS ($R^2 = 0.29$, 0.33 and 0.33 respectively). Further analyses revealed a 5-item tool of 'fruit' (B = 0.04, $P < 0.001$), 'vegetables' (B = 0.03, $P < 0.001$), 'sugary drinks' (B = −0.004, $P = 0.01$), 'coated chicken' (B = −0.05, $P = 0.03$) and 'wholemeal bread' (B = 0.04, $P < 0.001$) was moderately associated with the NDQS ($R^2 = 0.26$). When 'coated chicken' was replaced by 'beer, lager and cider' the model fit was improved ($R^2 = 0.28$). A tool of 'fruit', 'vegetables' and 'smoking status' was similarly predictive ($R^2 = 0.26$).
Conclusion
Brief tools can be used in the UK population to assess and monitor broad patterns of diet quality and may be of particular help in pragmatic evaluations with time and resource limitations.
Keywords
Diet Quality, dietary assessment, dietary patterns
Disclosures

RFC1.3

Methods for the economic evaluation of obesity prevention dietary policies and population level interventions in children: a systematic review and critical appraisal of the evidence

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Background
Whilst many studies investigate the effectiveness of interventions to improve nutrition and healthy eating in children and adolescents, few studies examine their cost effectiveness. This systematic review aimed to explore the methods used to conduct economic evaluations including long-term modelling of costs and health benefits of dietary population-level interventions within this age group.
Methods
Eleven peer-reviewed databases and five databases of the grey literature were reviewed between November 2018 and January 2019. A study was included if it: 1) was an economic evaluation alongside a clinical trial or modelling study based on a single effectiveness study, 2) evaluated an obesity-prevention dietary intervention, 3) targeted the general population of children aged 2–18 years, and 4) was conducted in a high-income country. Two reviewers independently screened studies, extracted data and assessed the quality of economic evaluations and decision-analytic models.
Results
A total of 20 papers met the inclusion criteria, comprising of 19 separate studies. All studies were school-based interventions, except for three, which were school and community based. Only four interventions strictly focused on diet and nutrition, whilst the remainder additionally incorporated a physical activity component. Eight studies conducted an economic evaluation alongside a clinical trial and 11 studies modelled long-term health and cost outcomes. Evaluations varied in methodological approaches. This included methods to predict, measure and value long-term benefits in adulthood from short-term clinical outcomes in childhood. Methods in which costs had been incorporated, inclusion of obesity-related disease states and calculations predicting their occurrence varied considerably between studies. Most commonly applied sensitivity analyses included variation of intervention effectiveness parameters and reductions in intervention effects with simulation time.
Conclusions
Heterogeneity in evaluation methods and techniques can lead to difficulties in direct comparison, as well as substantial differences of cost-effectiveness outcomes. The findings from this review provides a resource that can be utilised by researchers as a foundation for future evaluation and model developments for the evaluation of UK policies and interventions.
Keywords
Childhood obesity prevention, diet, systematic review, economic evaluation
Disclosures

RFC1.4

Abstract withdrawn

RFC1.5

Including psychological variables in health economic modelling of obesity

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Background
Health economic modelling is used to estimate the cost-effectiveness of obesity interventions, usually over a patients' lifetime. These estimates inform whether a treatment is recommended for funding or not. Due to the short-term nature of clinical trials and the mixed evidence regarding long-term weight maintenance, assumptions are made about the long-term impact of an intervention. We aimed to adapt an existing health economic model of obesity to include psychological variables. This has two potential benefits: (1) The psychological variables can be used in prediction of long-term BMI trajectories to improve estimates of effectiveness and cost-effectiveness; (2) The model could be used for pre-trial testing and intervention design to generate an expected change in BMI based on estimated change in psychological variables.
Method
To determine what variables to include we conducted a latent growth curve mediation analysis on data previously collected in a clinical trial of a commercial weight management programme. BMI and psychological variables were collected at 4 time points over 2 years. We will present an existing health economic model, the SPHR diabetes prevention model, and how this has been adapted to include the relevant psychological variables in the prediction of BMI trajectories.
Results
The trajectories of dietary restraint, autonomous diet self-regulation and habits mediated the significant positive effect of the intervention on BMI trajectories over two years. We will report how the cost-effectiveness estimates of behavioural interventions differed using the model with and without the adaptation.
Conclusions
Psychological variables are often collected and analysed in clinical trials of behavioural weight management intervention but are not routinely used in health economic models of obesity. This research gives an insight into how this data could be used to improve predictions of effectiveness and cost-effectiveness. This would lead to more informed decision-making regarding the funding of obesity interventions. While health economic modelling is often conducted post-trial, including these variables also enables the model to be used to inform intervention design.
Keywords
Health economic modelling, psychology, intervention

RFC1.6

Plate size and food consumption: A pre-registered experimental study in a general population sample

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Background
There is considerable uncertainty regarding the impact of tableware size on food consumption. Most existing studies have used small and unrepresentative samples and have not followed recommended procedures for randomised controlled trials, leading to increased risk of bias. In the first pre-registered study to date, we examined the impact on consumption of using larger versus smaller plates for self-served food. We also assessed impact on the underlying meal micro-structure, such as number of servings and eating rate, which has not previously been studied.
Methods
The setting was a purpose-built naturalistic eating behaviour laboratory. A general population sample of 134 adult participants (aged 18–61 years) was randomly allocated to one of two groups varying in the size of plate used for self-serving lunch: large or small. The primary outcome was amount of food energy (kcal) consumed during a meal. Additionally, we assessed impact on meal micro-structure, and examined potential modifying effects of executive function, socio-economic position, and sensitivity to perceptual cues.
Results
There was no clear evidence of a difference in consumption between the two groups: Cohen's $d = 0.07$ (95% CI [-0.27, 0.41]), with participants in the large plate group consuming on average 19.2 (95% CI [-76.5, 115.0]) more calories (3%) compared to the small plate group (large: *mean* (S.D.) $= 644.1$ (265.0) kcal, versus small: 624.9 (292.3) kcal). The difference between the groups was not modified by individual characteristics. There was no evidence of impact on meal micro-structure, with the exception of more food being left on the plate when larger plates were used.
Conclusions
This study suggests that previous meta-analyses of a low-quality body of evidence may have considerably overestimated the effects of plate size on consumption. However, the possibility of a clinically significant effect – in either direction – cannot be excluded. Well-conducted trials of tableware size in real-world field settings are now needed to determine whether changing the size of tableware has potential to contribute to efforts to reduce consumption at population-level.
Keywords
Plate size, Food consumption, Choice architecture, Nudging, Physical micro-environment
Disclosures
The authors do not have any conflicts of interest to declare.

RFC2.1

Bariatric surgery among older adults: a matched case-control study on 30-day and 5-year mortality and changes in Body Mass Index and HbA1c up to 5-years post-operatively

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Introduction
Obesity is common (prevalence 30%) in older adults (≥ 65 years). Bariatric surgery (BS) is the most effective intervention resulting in sustained weight loss and cardiovascular and metabolic benefits. However, the outcomes of BS in older patients are unknown.
Methods
A retrospective study utilising the bariatric database from a single UK NHS BS centre. We identified all older patients, aged ≥ 65 years old at surgery, who had BS between 2003 and 2013 and all were matched to 2 'typical' aged controls (38 – 53 years old, the age IQR for BS patients at our centre) for surgical procedure, gender, referral body mass index (BMI) and diabetes status. Data were obtained from both local and GP records. Survival was compared between cases and matched controls using Kaplan-Meier estimators and the log rank test up to 5-years post-operatively.
Results
The mean age (S.D.) for cases ($n = 41$) and controls ($n = 82$) were 67 (2.3) and 46 years (5.1), respectively. Mean BMI was 47 kg/m^2 (7.2), 34% were men and 59%

had Type 2 diabetes. There was 0% mortality in both cases and controls at 30-days post-operative. Over 5-years post-operative follow-up; there was 9.8% ($n=4$) mortality in older adults (9.8%) 1.2% mortality ($n=1$) in controls ($P=0.03$). No deaths were due to surgical complication. At 5-years post-operative, BMI reduction in older adults (7.2 ± 6.1 kg/m^2) was significantly less than younger controls (11.6 ± 8.6 kg/m^2) (t(72)$=-2.218$, $P=0.030$). Meanwhile there was no significant difference in change in HbA1c among patients with Type 2 Diabetes ($P=0.516$).

Conclusion

In older adults, BS was not associated with increased 30-day mortality or surgical-related mortality up to 5 years post-surgery. BS resulted in clinically meaningful BMI reductions in older patients at 5 years post-surgery. However, BMI reductions were significantly greater in younger patients at 5 years post-surgery. The impact of surgery on glycaemic control was similar across older and younger adults with Type 2 diabetes. BS is a valid option of treatment in older patients with obesity, future studies need to examine the impact of surgery on functionality and quality of life in this patient group.

RFC2.2

Short- and long-term reductions in physical activity attenuate the rate of weight loss during dietary energy restriction in women with overweight and obesity

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Background

Changes in body composition following energy restriction are highly variable between individuals, but whether adaptations in biological (resting metabolic rate; RMR) or behavioural (physical activity; PA) components of total energy expenditure (TEE) underlie this variability remains unclear. This study examined if changes in TEE and its components were associated with the rate of weight loss (WL) in women during energy restriction.

Methods

46 women with overweight and obesity (BMI$=29.1\pm2.4$ kg/m^2) were randomised to continuous (25% daily energy restriction) or intermittent energy restriction (alternate *ad libitum* and 75% energy restriction days) until $\geq5\%$WL or up to 12 weeks. At baseline, week-3 and post-intervention, body composition (air displacement plethysmography) and RMR (indirect calorimetry) were measured, while TEE and PA (min/day of sedentary, light and moderate and vigorous physical activity; MVPA) were estimated over 7-days (accelerometry). Adaptive thermogenesis (AT) was calculated as the difference between measured and predicted RMR (calculated using stepwise multiple regression with baseline body composition). Rate of WL was defined as percentage of WL divided by days to post-intervention measurement. Pearson's correlations were conducted for baseline-to-week-3 changes (short-term) and pre-post-intervention changes (long-term). Dietary groups were combined as no pre-post-intervention differences in PA or body composition existed.

Results

Data on 35 women that reached a WL of $6.0\pm1.6\%$ in 65 ± 17 days were available for these analyses. No associations existed between long-term changes in RMR ($r=-0.084$; $P=0.629$) or AT ($r=-0.095$; $P=0.587$) and rate of WL. However, long-term changes in TEE ($r=0.501$; $P=0.002$), total PA ($r=0.572$; $P<0.001$) and MVPA ($r=0.574$; $P<0.001$) were positively associated with rate of WL, while changes in sedentary time were negatively associated ($r=-0.552$; $P=0.001$). Short-term changes in MVPA were positively associated with rate of WL ($r=0.376$; $P=0.026$), while sedentary time appeared to be negatively associated ($r=-0.289$; $P=0.092$).

Conclusions

These data suggest that changes in PA and sedentary behaviour, but not RMR or AT, influenced the rate of WL during dietary energy restriction. Changes in PA were present early on during WL, but individual responses were variable and further research is needed to examine whether changes in PA act as markers of WL success.

RFC2.3

Exploring the effect of weight loss on food reward at the individual level

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Background

Contrary to the idea that compensatory increases in food reward occur after weight loss (WL), a systematic review has shown that liking (L) and implicit wanting (W) decrease after WL interventions. However, there is a large individual variability in WL-induced changes in food reward, with potential implications for weight regain. The aim of this multivariate analysis was to summarize the changes in L&W during WL at the individual level.

Method

30 women with overweight and obesity were assigned to either a continuous (25% energy restriction) or intermittent energy restriction (ad-libitum day alternating with 75% energy restriction day) until [3]5% WL within 12 weeks. Before an ad-libitum meal, at week 0 and after WL had been achieved, the Leeds Food Preference Questionnaire (LFPQ) was used to assesses L&W according to 4 categories of food (high-fat savoury, low-fat savoury, high-fat sweet and low-fat sweet). A principal component analysis (PCA) and cluster analysis were performed on the changes in 8 variables of food reward from the LFPQ.

Results

L (e.g. mean change in HFSW$=-7.26$, $P=0.029$) but not W decreased after a WL of -6.40% ($P<2e-16$). PCA revealed that changes in W were distinct from L as were responses to sweet versus savoury but not high-fat versus low-fat food categories. Cluster analysis identified three main patterns of WL-induced changes in food reward: (1) increase in L&W; (2) decrease in sweet and increase in savoury categories and vice versa; (3) decrease in L&W.

Conclusion

There is no 'one size fits all' effect of WL on food reward, and some individuals may show increases, decreases, or both, in their food reward depending on sweet or savoury taste. Liking and implicit wanting are methodologically and statistically distinct and individuals may respond differently according to these dimensions. These exploratory results should be replicated to investigate whether it could contribute in explaining why some people regain weight after WL.

Keywords

Food reward, weight loss, individual-level

Disclosures

None

RFC2.4

A low-carbohydrate, low-energy diet for people with type 2 diabetes in primary care: a randomised controlled feasibility trial

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Background

Clinical trials have shown promising evidence that low-carbohydrate diets can improve glycaemic control in people with diabetes but the interventions have been intensive and delivered in specialist settings or with specialist staff. Given that most people with diabetes are cared for in primary care, we examined the feasibility and initial effectiveness of a behavioural support programme for low-carbohydrate diets delivered by practice nurses for people with type 2 diabetes.

Methods

Patients with type 2 diabetes and BMI≥30 kg/m^2 were randomised 2:1 intervention or control (usual care) and followed up at 12 weeks. The intervention diet comprised eight weeks of a food-based diet estimated to provide 800 kcal/day, excluding all foods that contain significant amounts of carbo-hydrate, thereafter progressing to a low-carbohydrate diet intended to meet energy

needs for weight maintenance, for a further four weeks. Practice nurses delivered the programme in four 10–20 minute appointments, providing support and motivation, including advice on goal-setting and self-monitoring, and a self-help booklet with sample menus. Focus groups with participants and healthcare professionals explored intervention experience and acceptability.

Results

33 patients (55% female, 94% of white British ethnicity) were randomised, with a mean age of 67 years (sD 11 years), and baseline BMI 35.4 kg/m^2 (sD 4.7 kg/m^2). All patients agreed to attempt their allocated dietary interventions after randomisation, and all but one control group participant who died attended follow-up at 12 weeks. Mean ($\pm$sD) weight loss in the intervention group was 9.5 kg ($\pm$5.4 kg), compared to 2 kg ($\pm$2.5 kg) in the control group (adjusted between-group difference -7.5 kg (-11.0 to -4.0), $P < 0.001$)). Mean ($\pm$sD) reduction in HbA1c in the intervention group was 16.3 mmol/mol ($\pm$13.3 mmol/mol), compared to 0.7 mmol/mol ($\pm$4.5 mmol/mol) in the control group (adjusted between-group difference -15.7 mmol/mol (-24.1 to -7.3, P 0.001)).

Conclusions

It is feasible to recruit participants to a low-carbohydrate intervention, for practice nurses to deliver and support the programme in primary care, and to retain participants in both groups within a trial over 12 weeks. There is evidence of clinically significant improvements in weight and glycaemic control in the short term. This suggests a full trial is both feasible and worthwhile.

RFC2.5

Systematic review of brief interventions aimed at promoting energy balance behaviours delivered during antenatal care

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Background

Pregnancy provides a window of opportunity to prevent childhood obesity through lifestyle interventions to reduce the risk of delivery of large-for-gestational-age infants, and childhood and adult obesity. Given the abundance of novel information that midwives are required to discuss with women during pregnancy, a brief intervention may be a pragmatic approach. The objective of this systematic review is to assess the effectiveness and feasibility of brief interventions targeting diet, physical activity and weight monitoring behaviours delivered during routine antenatal care in improving energy balance behaviours (diet, physical activity) and gestational weight management.

Method

Twelve databases were searched for RCT/quasi RCT studies. Eligible interventions included 'brief interventions' delivered face-to-face or via phone during a single point of contact. A total of 9446 (non-duplicated) records were screened. The ROB2 tool for risk of reporting bias was applied.

Results

Nine studies met the inclusion criteria, of which eight were RCTs. Interventions included six trials focused on changing one energy balance behaviour, two trials targeting two behaviours, and one trial targeting all three behaviours. Most studies targeted weight monitoring ($n = 6$), or diet ($n = 4$), and fewer targeted physical activity ($n = 3$). One trial was directed at healthcare practitioners, and all other studies targeted pregnant women. In most cases, studies tested whether a brief intervention was more effective than standard antenatal care ($n = 7$), but two were additionally compared to a more intense intervention. Three weight monitoring studies resulted in significant reductions in weight gain, and two interventions resulted in significant improvements in diet quality. Follow-up of interventions focused on short-term effects, with all outcome assessments occurring in the last trimester. Study quality was variable; five studies were deemed 'high risk', three as 'some concern', and one 'low risk'.

Conclusion

Delivery of brief interventions during routine pregnancy care are achievable. Results suggest that brief interventions can improve weight monitoring or diet-related energy balance behaviours, with no effects on physical activity being observed. Larger and longer trials utilising heterogonous measures of diet, physical activity and weight monitoring are needed to inform the development of effective interventions preventing excessive gestational weight gain.

RFC2.6

Population level risk factors associated with childhood obesity

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Background/Objective

In Wales, approximately one in eight 4–5 year olds are obese. The aim of this cross-sectional study was to examine the association between childhood obesity and modifiable population level risk factors, after accounting for deprivation.

Methods

A review of the literature identified population level risk factors including: a healthy childcare setting; the local food environment; accessible open space, community safety and crime. Data for the risk factors were matched by each of the twenty-two Local Authorities in Wales to each child in the Wales Childhood Measurement Programme (2012–2017) ($n = 129, 893$, mean age 5.0 years, standard deviation 0.4 years). Multivariable logistic regression was used to identify associations with childhood obesity.

Results

After adjusting for deprivation, significant associations were found between childhood obesity and percentage of land available as accessible open space OR 0.981 (95% CI: 0.973 to 0.989) $P < 0.001$) and density of fast food outlets OR 1.002 (95% CI: 1.001 to 1.004, $P = 0.001$). No other population level risk factors were related to childhood obesity.

Conclusion

This cross-sectional study found a decreased odds of obesity in areas with more accessible open space and an increased odds of obesity in areas with a higher density of fast food outlets per 100,000 population.

Poster Presentations

P1

Using planning powers to promote healthy weight environments: Local authorities' insights on the implementation gap, and creation of planning guidance to tackle local obesogenic environments

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Background

Since the 2007 Foresight report there is better understanding of the obesogenic environment and how the planning system can impact on factors that contribute to obesity. The Town and Country Planning Association and PHE developed the Planning Healthy Weight Environment Framework. Little is known about how planners and public health professionals view the relevance of this Framework in practice. This research aims to understand their awareness of planning powers available to promote healthy weight environments, challenges they face in using these powers and demonstrate example of a supplementary planning document (SPD) as a planning power.

Methods

A qualitative methodology was employed between October and November 2018 to seek practitioner views of planners and public health professionals working in local authorities through focus groups (quantitative responses were sought through a survey), and of stakeholders through semi-structured interviews. The focus was on Lewisham and Gloucestershire, both pilots in the PHE Whole Systems Approach Obesity project, and wider stakeholders working in planning and public health in national organisations, academia and local authorities. The SPD is being created and draft presented in September.

Results

Results indicate an extant understanding of the Framework (more than 80% of respondents to the focus group surveys) which imply indirect recognition of causes of the obesogenic environment, and acknowledgement of current planning powers (regulatory, guidance and policy levers) at their disposal. However there is limited support in the form of training and formal guidance on potential applications of these powers to the Framework. This is compounded by influence of external forces, such as impact of reduced local authority capacity, competing policy priorities, silo-mentality between teams and professions, and inability to influence local political decision-makers.

Conclusions

The research will help increase awareness of political, financial and cultural factors influencing effective application of research and evidence such as the Planning Healthy Weight Environment Framework in practice. It highlights additional research is needed to collate practitioner views to fully comprehend the influence of implementation barriers to tackling obesogenic environments. It further stresses the need to recognise complex local delivery systems and governance structures with the benefits of creating locally-relevant planning guidance.

P2

The impact of HENRY on parenting and family lifestyle: An exploratory analysis of the mechanisms for change

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Background

Childhood obesity is a major public health concern. In the UK, a quarter of children have overweight or obesity at age five years. Children with overweight and obesity are more likely to develop serious health issues such as diabetes later in life. Consequently, there is an urgent need for effective, early obesity prevention and intervention. This study investigated the impact of an eight-week child obesity intervention – HENRY (Health Exercise Nutrition for the Really Young) - designed to help parents with preschool children develop the skills and knowledge needed to improve family lifestyle and wellbeing. We were particularly interested in exploring the potential mechanisms by which HENRY may have a positive impact.

Method

Focus groups ($n = 7$, total participants = 39) were completed with mothers attending the HENRY programme at one of seven locations across England. They took place within two weeks of programme completion. Follow-up telephone interviews were completed with a subsample of participants ($n = 10$) between 17 and 21 weeks later.

Results

Parents consistently reported enhanced self-efficacy in terms of improved confidence in their ability to encourage healthier behaviours such as eating fruit and increasing physical activity, and improvements to family health behaviours. Many changes were reportedly sustained at follow-up. Data provided insights into the potential mechanisms that created the conditions for the positive changes. Participants described the importance of mutual support, being listened to by facilitators and encouragement to identify their own ideas. Their comments indicated the success of a solution-focused, strength-based, partnership approach to supporting family lifestyle change.

Conclusion

The results of this study contribute to the body of evidence suggesting that HENRY may have a positive impact on parenting and family lifestyle behaviour. Although data were collected in 2011, the findings contribute to an understanding of the components of effective obesity prevention in young children.

P3

Abstract withdrawn

P4

Effect of bariatric surgery on LEP gene methylation in recall mucosal samples

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Background

Colorectal cancer (CRC) is the fourth most common cancer in UK. Obesity is a major modifiable risk factor for CRC. The *LEP* gene encodes the leptin hormone which is a key regulator of body weight. *LEP* is overexpressed in the colorectal mucosa of patients with CRC and may contribute to the development and progression of CRC. This study investigated the effects of weight loss induced by bariatric surgery (BS) on *LEP* gene methylation in rectal mucosal samples.

Methods

Rectal mucosal samples were collected at 10 cm from the anal verge using sigmoidoscopy from participants in the Biomarkers of Colorectal cancer After Bariatric Surgery (BOCABS) study before and 6 months after bariatric surgical intervention and from a healthy Control group. Methylation at 4 CpG sites within the *LEP* gene in DNA from rectal mucosal biopsies was quantified using pyrosequencing (Qiagen Pyromark Q96 ID).

Results

- DNA was extracted from rectal mucosal samples from 19 surgery participants (46.7 years old, 4 males) and 9 Controls (48.5 years old, 4 males). At 6 months post-surgery, mean BMI in participants fell from 42.9 to 33.1 ($P < 0.001$) but remained lower that that in the Control group (25.3).
- Before surgery, methylation of *LEP* was higher at all CpG sites in Controls than in participants with obesity (mean for all sites: 45.5% vs 53.9%, $P = 0.001$).
- After weight loss surgery, mean *LEP* methylation across all CpG sites increased significantly ($P = 0.005$) and there were significant increases at the 1st ($P = 0.003$), 3rd ($P = 0.005$), and 4th ($P = 0.001$) CpG sites. However, methylation remained lower than in Controls.

Conclusion
In individuals who were obese, weight loss following bariatric surgery tends to normalise methylation of the *LEP* gene. Since DNA methylation contributes to regulation of gene expression, the effects of this change in change in methylation on expression of LEP, and whether this epigenetic change relates to the protective effect of weight loss on lowering CRC risk, remain to be determined.

P5

Effectiveness of diabetes prevention programmes among Arab ethnic groups: A systematic review

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Background
Ethnic minority groups in upper-middle-income and high-income-countries tend to be socioeconomically disadvantaged and have a higher prevalence of type 2 diabetes mellitus (T2DM) that is seen in the majority population. The purpose of this systematic review of the literature is to examine the effectiveness of interventions for the prevention of T2DM in the Arab ethnic minority group, which is considered high risk.
Methods
The research questions in this systematic review were defined using the five 'PICOS'; Population, Intervention, Comparators, Outcome and Study Design. The studies included in this review included participants aged over 18 who are at risk of diabetes and do not have any known complex diseases that may influence the outcomes of this study; such as cancers, heart disease, genetic disorders. Interventions included behavioural and lifestyle interventions; combining both physical activity and dietary modifications or either separately and excluded pharmacological interventions.
Results
A variety of outcome measures were used by the various trials; diabetes-related biochemical blood values (HbA1c levels, lipid levels, blood glucose levels); results of validated attitudinal and behavioural questionnaires; knowledge of different diabetes-related topics; health related quality of life measures, weight, body mass index (BMI) or waist-to-hip ratios, and blood pressure measurements.
Conclusions
Culturally appropriate interventions have short-to-medium term effects of glycaemic control and on knowledge of diabetes and healthy lifestyles. None of the studies included in this review were long-term trials and so clinically important long-term outcomes could not be studied. No studies included an economic analysis. The heterogeneity of the studies makes subgroup comparisons difficult to interpret with confidence. Long-term, standardised RCT's are needed to compare the different types and intensities of culturally appropriate health education within defined ethnic minority groups, as the medium term effects could lead to clinically important health outcomes, if sustained.
This systematic review is the first to explore the effectiveness of prevention programmes in the Arab ethnic minority group. The systematic review may also identify specific gaps in the evidence which would inform agenda for future research and policy.

P6

Sex differences in effects of moderate-intensity acute aerobic exercise on food reward and appetite in persons with methamphetamine-dependence

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Background
Contrary to individuals with obesity, substance dependence is characterized by decreased response to food rewards. Methamphetamine (MA) is the second most common illegally used drug in the world and acute aerobic exercise can ameliorate drug craving in methamphetamine users. Men and women differ in food intake and drug seeking. This study aimed at determining sex differences in effects of moderate intensity acute aerobic exercise on food reward and appetite in MA abusers, by using functional near-infrared spectroscopy (fNIRS), Leeds Food Preference Questionnaire (LFPQ) and electronic appetite rating system.
Methods
Twenty-one men (BMI: 24.5 ± 3.2 kg/m^2; age: 31.1 ± 3.3 years) and nineteen women (BMI: 23.6 ± 2.2 kg/m^2; age: 26.5 ± 4.2 years), who met the DSM-V criteria for MA dependence, were assigned to two groups: Male and Female group. Each group also performed a resting control session for 35 min 1 week before or after the exercise, in a counterbalanced order. After exercise or control session, we using fNIRS to examine PFC responses to high and low fat food images. Food reward for high or low fat and sweet or savoury food images was assessed by LFPQ and subjective feelings of appetite were measured by VAS.
Results
Males show more implicit wanting for high-fat savoury foods than females at baseline. Exercise increased response to high fat foods and decreased response to low fat foods in some PFC regions in both male and female group. Greater relative preference, implicit wanting for high-fat savoury foods and explicit liking for low-fat savoury foods were noted following acute aerobic exercise compared to the control session. Exercise also increased subjective sensations of hunger and decreased feeling of fullness. There were also some correlations between food reward values and PFC responses of fat bias in exercise or control session.
Conclusions
Exercise may reestablish the food reward pathway and sensitivity to natural rewards in individuals with MA-dependence. This may be relevant for other conditions that affect the reward system such as obesity. Specific exercise programs for populations with methamphetamine dependence may be beneficial for recovery.

P7

The impact of adult weight management interventions on mental health: A systematic review and meta-analysis

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Background
The effects of weight loss interventions on physical health are well-described, yet their impact on mental health is unclear. Improved understanding of the impact of weight management interventions on mental health may improve care and minimise risk of harm. We aim to synthesise the evidence concerning the effects of adult behavioural weight management interventions, compared to inactive or standard care control groups, on mental health in adults with overweight or obesity. The primary objective of the systematic review is to quantify the effect of behavioural weight management interventions on mental health in adults with overweight and obesity. The secondary objective is to quantify if particular intervention or participant characteristics influence the effect of interventions on mental health.
Methods
We searched the following databases from inception to 07/05/2019: MEDLINE, Embase, Cochrane (CENTRAL), PsycINFO, ASSIA, AMED, and CINAHL. The search strategy was based on four concepts: (1) Adults with overweight/obesity, (2) Weight management interventions, (3) Mental health outcomes, and (4) Study design. The only restriction was to English-language publications. We included evaluations of behavioural weight-management interventions aiming to achieve weight loss through changes in diet and/or physical activity in community-dwelling adults with a body mass index ≥ 25 kg/m^2. Studies with an inactive or 'standard-care' control group were included. Randomised controlled trials (RCT) and cluster RCTs were the only eligible study designs. Outcomes of interest are:

Quality of life; Mood/Affect; Stress; Self-esteem; Body image; Emotional eating; Binge eating; Depression; Anxiety.

Two stage eligibility screening, data extraction and risk of bias assessment are being completed independently by a minimum of two investigators. Data permitting, a random-effects meta-analysis, sub-group analyses and meta-regression will be conducted. Sub-group analyses will compare population characteristics, intervention type, intervention duration, intervention delivery format and comparator type. Risk of bias in the included studies will be assessed using the Cochrane 'Risk of bias' tool. If meta-analysis is deemed inappropriate, narrative synthesis, 'levels of evidence' assessment and harvest plots will be used. Ethical approval is not required as primary data will not be collected.

P8

Best Practice: Manchester Healthy Weight Project

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Background
The Manchester Healthy Weight Project Team were established in September 2018, in response to rising levels of severe obesity across Manchester and a Serious Case Review where a child in Manchester died at the aged 13 years old from a heart condition exacerbated by morbid obesity.

The team includes a dietitian, healthy weight project nurses and a healthy weight project co-ordinator. The team are part of Children's Community Health Service within the Manchester Local Care Organisation and work alongside key partners such as GPs, Schools, Children's Social Care School Health Nurses and Health Visitors.

Methods
The team work with reception-aged children who are identified as severely obese through the National Child Measurement Programme. Parents/carers are pro-actively contacted by the team following their height and weight measurement in school, and are offered individualised weight management support within their home or the school setting. Families are provided with advice around healthy eating, physical activity and behaviour change and are signposted to physical activity opportunities in the community. A holistic approach to supporting the family is undertaken through the completion of Early Help Assessments with parents consent.

Frequency of contact with the service over a 12 month period is decided between the parent and the health care professional, allowing for greater flexibility for the families of Manchester to access weight management support. Children's height and weight is measured between monthly and three monthly intervals depending on a child's progress towards a healthy BMI centile range.

Engagement outcomes
Within the first 6 months of the project, we achieved a 89% engagement rate following our pro-active phone calls, an increase from the 5% achieved the previous year by the tier 2 weight management service (unpublished data). In a best practice example by the Wirral, only 19% of parents of reception aged children who were identified as very overweight, requested to be referred to a weight management service following a pro-active phone call from the School Nursing Service (Hughes & Timpson, 2014).

Further outcomes
Further outcomes collected are BMI SDS, Total-SDQ score, change in dietary and physical activity behaviour and parent/carer and child feedback.

P9

A mixed-methods study exploring adults' use of dessert-only food retail outlets

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Background
Studies examining the relationship between the retail food environment and obesity have yielded conflicting results. Recent work has highlighted the need to better understand different types of retail food outlet and the nuances of how different groups of consumers use them. Here we investigated how and why adults use dessert-only outlets. Despite being identified as a UK top 10 growing retail category (Local Data Company Report, 2018), this is an extremely understudied topic.

Methods
We used a mixed-methods approach with participants completing an online questionnaire consisting of both closed and open-ended questions exploring different aspects of the use of dessert-only restaurants (e.g., frequency, reason for visiting and place within broader meal pattern/ lifestyle) and individual difference characteristics (demographic and eating style).

Results
203 participants (Female $=151$; Mean age $=35.3$ years (s.d. $=14.3$); Mean BMI $=26.7$ kg/m^2(s.d. $=5.76$)) assisted with the study. Very few participants reported using dessert-only restaurants frequently (3%), the majority of participants reported using them occasionally (20%), rarely (19%) or very rarely (39%). Inductive thematic analysis revealed major themes for why outlets were visited including menu-related motivations, the influence of marketing, family time and social opportunities, cost, and cultural influences. Major themes for how visits were incorporated into broader meal patterns/ lifestyle included meal replacement, an alternative venue for dessert following a meal at another restaurant or home, compensation before and after visit, and spontaneous treats. Notable sub-themes included the importance of the alcohol-free environment and the opportunity to photograph desserts and post them on social media.

Conclusions
These findings are likely to be of use to local government who might be considering the use of exclusion zones for certain types of outlets. Despite the intuitive appeal of such approaches, understanding the context of usage might help to avoid unintended consequences and/ or futile efforts.

P10

Abstract unavailable

P11

The classification of physical activities from accelerometer and heart rate data: Machine learning approaches

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Background
Participation in physical activity (PA) and avoidance of sedentary behaviours (SB) are important factors in the prevention of obesity. Self-report PA measures are subject to misreporting and therefore objective, accurate measurements are required. Machine learning (ML) applied to physiological and accelerometery data may offer a means to improve the classification of PA.

Methods
Subjects ($n=59$) were recruited to participate in a protocol consisting of resting, ambulatory, running, cycling and household tasks, whilst wearing an

accelerometer (Actigraph GT3X) and a heart rate sensor (Polar H7). After incomplete data were removed, 2049 min ($n=55$) of steady state accelerometer, heart rate and participant data were to available to develop ML models. Algorithms included: Naïve Bayes (NB), k-Nearest Neighbour (k-NN), Support Vector Machines (SVM), Random Forest (RF) and Artificial Neural Networks (ANN). The developed models were trained to predict i) activity type and ii) activity intensity category, defined by metabolic equivalents (METs) (light: <3, moderate 3–6 & vigorous >6). ML models were validated with a leave-one-out cross validation approach.

Results
To predict activity type, ANN, K-NN, SVM and RF exceeded 95% F1-score and k-NN was 100% accurate for the classification of SB. To classify MET category, all models surpassed the accuracy of the Sensewear Armband (70.8%), with k-NN having the highest F1-score (94.2%).

Conclusion
The developed algorithms demonstrate a high degree of accuracy for the classification of type and intensity of PA. ML algorithms outperform a widely used and validated research-grade device.

Keywords
Machine learning, physical activity, sedentary behaviour, accelerometer

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P12

A methodology to minimise the effect of missing data for the use of commercial activity monitors in free-living subjects

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Background
Wearable devices are increasingly utilised to estimate physical activity (PA) in free-living subjects. These monitors facilitate long-term, associative research and generate extremely large datasets, providing new opportunities for research. With these new opportunities comes new considerations for researchers.
Based on the results of preliminary autocorrelation analyses, we developed a novel framework which utilises local, hourly PA data to account for missing data and therefore minimise the extent to which missing data can bias conclusions. This study compared the framework to alternative strategies used in accelerometer research.

Methods
A simulation study was conducted using the 14-days of minute-level, Fitbit charge 2 data collected in the NoHoW trial (ISRCTN88405328). Participants were selected based on amount of non-wear time ($<2\%$). Next, PA data were deleted at random to produce datasets with 13–15% missing data, occurring at random time points. Relative to the 'true' data, we compared the bias introduced by the framework, the removal of missing data, mean imputation and multiple imputation.

Results
Comparisons were made using true and imputed data for 53 participants (minutes $=1,068,480$, hours $=17,808$, days $=742$). Using the proposed framework, agreement with the 'true' data was superior to alternative strategies, with the root mean squared error in average steps/day for the framework being 313, compared with 527 for multiple imputation, 536 for mean imputation and 1393 for removal.

Conclusion
The proposed framework produces excellent agreement between true and imputed data. This novel method has applications for the maximisation of data utilisation and the minimisation of bias in PA research using commercial activity monitors.

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P13

The Impact of Bariatric surgery on Cardiovascular disease, mortality and weight in Elderly patients in the UK: A population-based matched controlled cohort study

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Background
Bariatric surgery (BS) is an effective treatment to produce long-term weight loss and reduction in obesity-related complications. However, the outcomes and safety of BS in older people has not been well examined and real-world data from the UK is lacking. Furthermore, with increasing life expectancy and rising obesity prevalence, increasing number of older patients are eligible for BS. Hence, we aimed to assess the impact of BS on weight, incident cardiovascular disease (CVD) & mortality in older patients in the UK.

Methods
We conducted a retrospective cohort matched-controlled study of older adults (≥ 65 yrs) who had BS (Gastric band, sleeve gastrectomy & gastric bypass) between 1/1/1990–31/1/2018. We used The Health Improvement Network (THIN), a validated & representative primary care electronic database. Each exposed patient (had BS) was matched to 2 controls (no BS) for age, gender and body mass index (BMI). The variables included in the study were identified using Read codes. CVD was defined as a composite of ischemic heart disease (IHD), heart failure (HF) & cerebrovascular accident (CVA).

Results
The analysis included 156 exposed & 299 control participants with mean (S.D.) age 67.3 (2.6) years, 65.05% were female & median (IQR) follow-up duration 2.92 years (1.39–5.31 years). The percentage total body weight loss (mean $\pm$ S.D.) was greater in the exposed ($19.1\% \pm 11.9$) vs control group ($0.93\% \pm 5.4$). Incident CVD developed in 7 vs 21 participants (HR 0.62, 95%CI (0.26–1.48), $P=0.28$). After adjusting for age, gender, BMI, diabetes, hypertension, smoking, alcohol intake, social deprivation score & ethnicity, the HR for incident CVD in the exposed vs control was 0.53 (95%CI 0.21–1.33, $P=0.178$) mainly driven by reduction in incident HF with adj HR of 0.13 (95%CI 0.02–1.06, $P=0.056$). The number of deaths were 16 vs 26 participants (IR 30.91 vs 23.9 per 1000-persons-year) the exposed vs control groups respectively. After adjusting for the same variables as above and Charlson comorbidity index, the HR was 1.30 (95%CI 0.65–2.60, $P=0.453$).

Conclusions
BS is effective weight loss intervention in older patients. There was trend towards reduction in combined CVD in BS group vs. controls with significant reduction in incident HF. Non-significant increase in mortality was noted which requires further examinations.

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P14

Abstract unavailable

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P15

Using innovative approaches to manage child and adolescent obesity in a multidisciplinary level 3 service (connect) within a value based healthcare programme

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In the Aneurin Bevan University Health Board (ABUHB) area (Wales, UK), prevalence of overweight and obesity in children (4–5 years) are approximately

13.5 and 11.6% ($n = \sim 1650$) respectively (Child Measurement Programme for Wales, 2017–18). It was estimated that approximately 4400 children (4–18 years) have severe obesity (BMI ≥ 99.6th centile) in the ABUHB area. An audit of ABUHB paediatric case notes indicated that almost one-third of patients had overweight or obesity ($n = 1182$), with nearly one-fifth having obesity ($n = 648$). Six percent ($n = 216$) of these patients had severe obesity. Value Based Healthcare (VBHC) aims to increase the value that is derived from the resources available for a population (Gray, 2017). ABUHB operates a VBHC programme whereby 'value' is based on the Porter Model (patient value = patient-relevant outcomes/costs per patient to achieve these outcomes), initiatives are clinically-led but focused on patient outcomes, and look to ensure 'allocative value' (i.e. resources are moved to where they can have the greatest impact for patients and their experience of care). In these contexts, in 2018 the ABUHB commissioned a tier 3 multidisciplinary treatment (MDT) service (named Connect) for children and adolescents aged 0–16 years. This service is family-focused and has several innovative features. Individual, patient-centered treatment is allocated following the Care Aims framework (*https://careaims.com/*) which is designed to focus on outcomes that are important to the patient and encourages clinicians to use appropriate interventions during specific episodes of care. Outcome evaluation is being undertaken using a variety of clinic measured (e.g. change in BMI-z-score, blood pressure and lipids) and patient-reported outcome (PROM) and experiential measures (PREM) (e.g. functioning, disability & health; quality of life; sedentary time). DrDoctor (*https://www.drdoctor.co.uk/*), a digital outpatient management solution, is being used to enhance communication with patients and to collect PROMs and PREMs. In accordance with the concept of VBHC, financial cost data are also being considered as part of a comprehensive evaluation of this service. This MDT service commenced in May 2019 and aims to support approximately 250 children & families in the first 12 months.

Disclosures
None.

P16

Evaluating the Change4Life Food Scanner app: protocol for a randomised pilot and feasibility trial

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Background
Children's sugar intake in the UK is above current recommendations, contributing to the rise of overweight and obesity. The Change4Life Food Scanner app aims to encourage parents to reduce their children's sugar consumption. The app allows for packaged foods to be scanned and displays total sugar content in cubes and grams. To date the app has not been independently evaluated despite its popularity on the app market. This research aims to develop a pilot and feasibility randomised controlled trial to evaluate the effectiveness of the Food Scanner app in reducing children's sugar and energy intake and explore possible dietary compensatory behaviours. An early economic evaluation will be undertaken alongside the feasibility trial providing insights into associated potential costs and benefits of the app.

Methods
Parents of 4–11 year olds will be recruited and randomised into an intervention arm, with app exposure, or a control arm. Over three-months, participants will complete baseline and follow-up measures of dietary intake (3-day food diary) and psychological predictors of behaviour change. The latter will include questions on parental attitudes on child sugar intake as well as knowledge on sugar intake recommendations and nutritional food labels. Those receiving the intervention will be asked both closed- and opened-ended questions on app engagement, experience and feedback.

Results
Results will indicate the effectiveness of using explicit images of sugar intake on dietary changes, including compensatory behaviours, as well as insights into the psychosocial factors that may mediate such relationships. Cost-effectiveness will be determined through the calculation of an incremental cost effectiveness ratio and net monetary benefits at a £20,000 willingness to pay threshold. Additionally, qualitative analysis of open-ended questions will identify app improvements to encourage longer-term engagement.

Conclusions
This research aims to determine the feasibility of a fully powered RCT and will help provide useful insights into the effectiveness, cost-effectiveness and suggested improvements of the Food Scanner app.

P17

The effects of Plant- based Dietary Recommendation on Parameters of Health

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Background
To determine the effect of plant- based diets on body composition, blood glucose and cholesterol.

Methods
10 females (BMI 30.5 ± 3.7; age 39 ± 6; weight 86 kg ± 14.4) enrolled in a 6 week nutritional education programme. Participants were active prior to and during the study. Participants completed an initial reset which eliminated all refined sugar, heavily processed foods, artificial sweeteners, alcohol, meat and fish from the diet. All foods could then be reintroduced into the diet. Participants were provided with an ABC model of eating. Participants recorded a food diary prior to the study and during the 6 week period. Participants attended weekly 1.5 h meetings for 6 weeks and were added to a social network support site for 24 h support. Baseline BMI, body composition, WC, BG, TC, LDL and HDL were all measured and again at 6 weeks.

Results
Using a paired samples t-test, at the 6 week point both body weight (86 kg vs 82 kg, $P = 0.00$) and BMI decreased (30.5 vs 29.2, $P = 0.00$). Waist circumference (97 cm vs 93 cm, $P = 0.01$) and body fat % (36% vs 33%, $P = 0.01$) were also reduced. Blood glucose also reduced after the 6 week dietary intervention (5.19 mmol/l vs 50.1, $P = 0.02$) and there was a trend for both total cholesterol (5.4 mmol/l vs 5.3 mmol/l, $P = 0.24$) and LDl cholesterol (3.08 mmol/l vs 2.88 mmol/l, $P = 0.16$) to be reduced, whilst an increased in HDL was observed (1.68 mmol/l vs 1.72 mmol/l, $P = 0.31$).

Conclusion
Adoption of a plant based diet was associated with significant weight loss and changes in body composition in females of varying weights and age. This is despite an absence of prescribed restrictions on energy intake and food choice. Analysis of the 6 week dietary intervention data revealed a dietary composition of 40% carbohydrates, 40% fats and 20% protein to be successful in achieving these changes in body composition and blood glucose levels. Therefore, the adoption of a plant-based dietary approach appears to be beneficial for weight loss, blood glucose and cholesterol levels, however, longer-term trials are needed to explore these conclusions further.

P18

The colour of appetite: How does ambient colour affect appetite?

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Introduction
Obesity is the second greatest contributor to the burden of disease in Australia. Overconsumption of food is a potent contributor to weight gain and obesity. A series of hedonic and homeostatic processes lead to increased drive to eat. Colour has long been associated with mood, and mood has also been shown to be associated with appetite. However, empirical evidence exploring whether directly manipulating light colour affects appetite is limited. This pilot study aimed to explore whether ambient light colour could moderate appetite.

Method
Fourteen male university students (aged 18–30 years) participated in three conditions on separate days. The conditions were exposure to ambient blue light (B), pink light (P) and red light (R). Participants completed subjective appetite ratings (VAS) and Liking and Wanting (Leeds Food Preference Questionnaire)

measures immediately before and after exposure (3 min.) to the different light conditions.

Discussion

Preliminary analyses indicates that the colours exerted varying effects on subjective appetite. There was a trend for pink light to increase hunger by 5%, whereas blue and red light suppressed hunger by 5%. Although the changes were relatively small, there was a trend for blue and red light to exert a different effect on Liking and Wanting compared with pink light. This pilot study provides preliminary evidence that light manipulations could moderate appetite and food preferences.

P19

Exploring pupil and staff perceptions of school food and drinks: Findings from a feasibility study

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Background

Overweight/obesity affects at least one third of UK 11–15 y olds. Individually focussed interventions alone have proved to have limited effectiveness. Food choice architecture offers a structural approach to increase the visibility and convenience of foods to facilitate the choice of 'healthier' foods and also reduce choice of 'unhealthy' foods. This School Food Architecture (SFA) qualitative study aimed to determine the perceptions of pupils, teaching and catering staff in relation to school food provision and; to determine the perceptions of a recently implemented SFA intervention.

Methods

Sixteen pupils from two schools participated in focus groups; eight school staff members participated in one-to-one interviews. Topic guides were developed from literature and in consultation with a Young Person's Advisory Group. Thematic analysis was applied.

Results

Focus group themes included: dining hall day-to-day practices; determinants of choice; and aspects of health. Interview themes included: catering practices; perceptions of food provision; health awareness and education; and perceptions and knowledge of intervention. Pupils liked to purchase hand-held, quick to purchase food items (paninis/pizza) which potentially limited their access to fruit and vegetables. They were aware of 'healthier' food choices but would choose other options if available. Staff were surprised at sugar content of some drinks and reported increased interest from pupils in fruit purchases during the intervention.

Conclusions

Schools feed large numbers of pupils daily in challenging circumstances. Given that children consume 35–40% of their daily energy intake at school, interventions which enable healthier eating habits in school should be developed and maintained.

Keywords

School food, food choice architecture, public health, qualitative research

Disclosures

None to declare.

P20

Clinically significant weight outcomes at 12-weeks for adults across English regions and deprivation deciles following attendance at a commercial weight management programme

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Background

Prevalence of obesity among adults varies across English regions and is higher in more deprived areas. Slimming World is a commercial weight management organisation with around 14, 500 groups across England. Individuals attend through self-funded membership or through Slimming World on Referral where membership is commissioned by the NHS or local government. The aim was to understand weight outcomes for self-funded and referred members across deprivation deciles and regions of England.

Methods

Weight data in all members joining during 2016 was analysed ($n=830{,}038$). Residential address was used to assign individuals to a deprivation level (Index of Multiple Deprivation) and a region based on Public Health England Centre geographies. Last observation carried forward was used to account for missing data.

Results

Mean weight change at 12 weeks in the sample overall was $-5.1\pm3.7\%$. In self-funded members this was $-5.0\pm3.7\%$ and in referral scheme members it was $-5.6\pm3.8\%$. In referral scheme members ($n=27{,}560$), mean weight change was -5.1 ± 3.7 and -5.9 ± 3.7 in the lowest and highest deprivation deciles, respectively. There was no significant effect for region for these deciles. In self-funded members ($n=802{,}478$) mean weight change was $-4.7\pm3.7\%$ and $-5.2\pm3.6\%$ in the lowest and highest deprivation deciles, respectively. The effect of region was significant but small ($\eta_p^2<0.000$) indicating little meaningful difference across regions.

Conclusions

These results indicate that Slimming World successfully engages with and supports individuals to reach clinically significant weight losses across England, independent of region and deprivation.

Keywords

Weight management, health inequalities

Disclosures

P21

Are brief interventions for obesity in primary care effective when patients are asked to pay for weight-loss treatment? An observational study with embedded randomised trial

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Background

A brief intervention in which physicians opportunistically endorse and facilitate an NHS-funded referral to a weight loss programme is clinically and cost-effective. In some areas physicians are unable to make NHS-funded referrals, but could recommend weight loss programmes at the patient's expense. The aim of this study was to test the acceptability of a brief intervention and attendance at a weight loss programme when physicians endorse and facilitate a referral that requires patients to pay for the service.

Methods

This was an observational study of the effect of a physician encouraging attendance at a weight-loss programme, requiring payment by the patient, to compare with a previous trial where the service was funded by the NHS. In addition, patients were randomised to receive information on the cost of the programme in one of two ways. Sixty patients with obesity who consecutively attended primary care appointments were enrolled and received an opportunistic brief intervention by their GP to endorse and offer a referral to a community weight loss programme at the patient's own expense. Participants were randomised to physicians stating either the weekly monetary cost of the programme (basic cost) or comparing the weekly cost to an everyday discretionary item (cost comparison). Participants were subsequently contacted by a researcher and asked to report whether they had attended a weight loss programme.

Results

Overall 47% of participants accepted the referral; 50% in the basic cost group and 43% in the cost comparison group. This was significantly less than previously when the programme was funded by the NHS (77%, $P<0.0001$). Immediately after the consultation most participants reported the physicians intervention to be helpful and appropriate, but these scores were significantly lower than when the programme was funded by the NHS ($P=0.004$). One person attended the weight loss programme (2%), significantly less than when the programme was funded by the NHS (40%, $P<0.0001$).

Conclusion

GP referral to a weight loss programme that requires patients to pay rather than offering an NHS-funded programme lowers agreement to attend and leads to almost no attendance, even though it is acceptable.

P22

The Test Re-test reliability of the Leeds Food Preference Questionnaire for quantifying food reward in Obesity and Lifestyle research

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Background
To better understand the role that food reward and eating behavior have on obesity and lifestyle management strategies, reliable and valid measurement tools are needed to quantify modern day eating behaviours and food preferences. This study aims to determine the test-retest reliability of the Leeds Food Preference Questionnaire (LFPQ) in a South African population. The validity of the tool was assessed by investigations of its associations with other eating behavior outcomes such as the three-factor eating questionnaire and the emotional eating questionnaire.

Methods
Twenty healthy participants took part in the study. They had a mean age of 35.5 ± 13.3 years and a body mass index of 28.6 ± 7.0 kg/m^2. Prior to visiting the laboratory participants completed questionnaires pertaining to their well-being, including the emotional eater questionnaire (EEQ), the eating disorder examination questionnaire (EDE-Q), and the Three Factor Eating Questionnaire (TFEQ). Participants visited the laboratory on two occasions, seven days apart, to undergo LFPQ and the Three Factor Eating Questionnaire (TFEQ). Results of these questionnaires were analysed for test-retest reliability and associations between their outcome. measures.

Results
Intraclass correlation coefficients (0.72–0.93) of the LFPQ demonstrated good to excellent reliability. The Bland-Altman plots showed very small bias on average and the effect sizes revealed diminutive effects < 0.2 for the majority of outcomes.

Conclusions
Thorough analysis of the test re-test reliability and validity of the LFPQ has demonstrated its usefulness for Clinicians and Researchers to use as a tool to distinguish between and quantify different components of food reward. The use of this tool will enable researchers to gain more in-depth detail of food reward behaviour and better assist individuals who are seeking eating behaviour interventions for obesity and lifestyle behaviour management.

Keywords
Eating behaviour, food reward, obesity management, obesity

P23

Takeaway food outlets around secondary schools in the UK: Using different methods for evaluating the takeaway food environment

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Background
The location of takeaway food shops is becoming increasingly studied in the UK with growing concerns around diet and obesity. UK planning policies to limit takeaways have been poorly thought out compared to other countries. There are no standardised measures used to measure the food environment around homes, schools, work or any other facilities. This study aims to examine the differences in using different methods to evaluate the food environment particularly around secondary schools in the Avon region in the UK.

Methods
Geographical Information System was used to locate all schools and takeaways in the region and to measure the density and proximity scores, applying both road network and straight-line methods. In addition, the Hansen Index was used to measure the accessibility score of each school to all takeaways in the region (not just the nearest). All of the statistical analysis tests were carried out using Stata software.

Results
More than half of the schools had no takeaway outlets within 200, 400, and 600 metres when the road network buffer was used. Wilcoxon signed ranked test results showed statistical significant differences in the density and proximity of takeaways between both circular and road network methods. The results also showed that there were fair and moderate agreement between straight-line and road network densities within 800 and 1000 metres, respectively. Also, the agreement between both methods to measure the proximity was fair to moderate. In addition, correlation test showed that the accessibility score was not dependent on the distance between the school and the nearest takeaway outlet using either the straight-line or the road network distances.

Conclusions
We recommend the use of 800 and 1000 road network metres and based on our findings the agreement between both methods to measure the density and proximity was not strong. A consistent approach to the methods used to measure the density, proximity or accessibility of food outlets, particularly around schools, is needed. This may help to enable promising policies to be implemented by governmental organisations and all related stakeholders and to effectively evaluate the impact of limiting the number of takeaway outlets around schools.

P24

Development and validation of a novel weight loss maintenance knowledge and beliefs scale

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Background
Obesity interventions mainly focus on weight loss. However, weight loss maintenance (WLM) is the greater challenge as 80% of individuals who lose weight regain the lost weight within a year (Wing & Phelan, 2005). Knowledge and beliefs about WLM influence behaviour and are important factors in distinguishing between successful and unsuccessful weight loss maintainers. However, there are currently no validated scales available that measure WLM knowledge.

Methods
To address this gap, a novel 40-item scale was developed to measure accuracy of knowledge and beliefs regarding factors that influence WLM, specifically targeting nutrition, physical activity, weight monitoring, beliefs about weight management and obesity, hunger and caloric compensation. This study used a 'think aloud' method to assess the understanding and interpretation of the items. Sixteen participants (50% females; $28.69 \pm$ s.d. 3.50 years; self-reported BMI $24.41 \pm$ s.d. 2.66 kg/m^2) verbalised their thoughts and answers while completing the scale in the laboratory. Data analysis aimed to identify any issues with item understanding and interpretation. Interviews were transcribed verbatim and data was coded to show issues per item. Issues were then categorised by themes.

Results
Most common issues encountered were related to the broadness, specificity and possible interpretations of the items. As a result, 23 of the items were reworded to address the issues raised in the interviews.

Conclusions
A novel scale has been developed to measure the accuracy of knowledge and beliefs about WLM. Following a 'think aloud' task the scale has been refined to improve understanding and interpretation of the items.
This scale will be validated to identify individuals at greatest risk of weight regain and identify the beliefs, attitudes and behaviours that need to be targeted in future WLM interventions.

Keywords
Weight loss maintenance, nutrition, calorie balance

P25

Effects of advertising on children's understanding and attitudes: use of public and patient involvement to understand young people's response to a systematic review

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Background
Food advertising increases young people's acute calorie intake and in response, the UK Government is consulting on a 9 pm pre-watershed for television/online

advertising for high fat, salt or sugar (HFSS) foods; however, more subtle effects of advertising on children's understanding and attitudes are unclear. We undertook a systematic review assessing the influence of advertising on children and adolescents' decision-making. A key element of the work was a patient and public involvement (PPI) exercise which sought to gain an understanding of young people's perspectives of the findings and proposed policy changes.

Methods
The PPI group comprised young people from across England and was facilitated by the National Children's Bureau in London, UK. The young people were all trained 'young research advisers', aged 8–25 years. Researchers facilitated a 2-hour group discussion to explore what the young people perceived to be the key findings from the review and to discuss proposed and potential policy initiatives.

Results
Nine young people (aged 10–23 years) agreed that advertising strongly influences behaviour, even if there is an understanding about the persuasive nature of advertising. The group supported a pre-watershed ban of television advertising of HFSS foods. There was support for either an overall online pre-watershed ban or for targeted sites (e.g. YouTube). The group was surprised that advertising restrictions were self-regulated and were aware of pressures from the food industry. The young people had various ideas for future policy initiatives: adverts be labelled within social media posts and with stricter rules for 'influencers'; clearer warnings on food packaging; improved ease of lodging complaints; increased advertising of healthy foods; and increased availability of affordable healthier foods.

Conclusions
This user-involvement group were enthusiastic about the topic, felt strongly that advertising was a powerful influence on young people's behaviour, and should be strongly regulated. The PPI exercise was insightful, and made a substantial contribution to the potential impact of this work on policy initiatives.

P26

Family-centred approaches to developing 'Connect'; the first specialist weight management service for children and young people in Wales

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Background
There are few specialist weight management services for children and young people in the UK (APPGO, 2018). Retention in such paediatric services can be difficult (Jelalian *et al*., 2008), and minimising attrition is critical for achieving good outcomes with this group (Hampl *et al*., 2011). Families can be reluctant to engage due to practical constraints, a lack of personalised care (Hampl *et al*., 2014) and the perception that services can exacerbate stigma and shame (Falconer *et al*., 2014).

Methods
'Connect' in Aneurin Bevan University Health Board is the first specialist (level 3) service for young people in Wales. It opened to families in May 2019 using principles of coproduction and individualised, family-centred care. Focus groups and telephone consultations were initially conducted to inform service development and 17 families contributed to this process.

Results
Feedback emphasised the need for a non-stigmatising service name which was not obviously associated with obesity. Easy access was considered important, so Connect offers multiple venues and home visits. Families were keen to work with different professionals depending on need, therefore the multidisciplinary nature of the Connect team is a significant person-centred strength. Further efforts have facilitated engagement, including explanatory telephone calls prior to assessment, sending out a leaflet with team photos, and addressing letters directly to the family. Connect has also adopted the Care Aims approach (Malcomess, 2015); a framework for service improvement based on the principle of doing most good and least harm, within the resources available. Active triage ensures Connect is the most appropriate service at a given time, and clear goals are based on what is meaningful for the young person. Empowering families is key, therefore discharge is timely, however the service is easily accessible again if needed in future. Care Aims also encourages up-skilling other networks in order to influence the care of as many families as possible within a small team remit.

Conclusion
Connect is the first level 3 weight management service for children in Wales and has been coproduced by specialist health professionals and the families it aims to support.

P27

Why does attrition to Weight Management Interventions differ with deprivation and does it have anything to do with equity?

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Background
Weight management interventions (WMI) focus on behaviour change at the individual level based on a behavioural model of choice that assumes information drives behaviour (model of responsibilisation). Attrition is often low, and concerns have been raised about interventions widening health inequalities.
One policy-based approach proposed to achieve equity is proportionate universalism. This balances targeted and universal population health approaches through actions proportionate to the needs and levels of disadvantage.
The aim of this study is to understand attrition by understanding the experiences of individuals eligible for WMI.

Methods
Semi-structured interviews with members of a triage team, the point of entry to a lifestyle programme (where WMI are one element). Descriptive data. Semi-structured life history interviews with 21 interviewees drawn from a spectrum of attrition ('do not attend', 'drop-out' and 'complete') and deprivation. Data were analysed using thematic analysis.

Findings
The current lifestyle programme recruited 55% of individuals that started one of the programme elements from the 40% most deprived lower super output areas (LSOA's). However, individuals from the 20% least deprived LSOA's were more likely to complete the WMI compared to individuals from the 20% most deprived LSOA's.
Interviews with the triage team revealed the lifestyle programme was rooted in a model of responsibilisation that treats everybody equally.
Completing the WMI depended on the socio-cultural environments that individuals were embedded within. Completers had the support of partners, whereby food related change was small and meaningful to the collective and food competences existed at a practice, not individual level. Individuals who do not attend lacked social support and food competences, while they were asked to change in ways that were not meaningful.

Conclusion
This research suggests that attrition is influenced by the privileges afforded to individuals because of their coincidental socio-cultural environments. Equity might have been achieved at a policy level through proportionate targeting, but the WMI was not tailored to the needs of those most in need. It is therefore suggested that it was not equitable at a delivery level. Taking a proportionate approach that delivers based on the needs of individuals would achieve greater equity.

P28

Use of an ECAL indirect calorimeter measuring resting metabolic rate and fat burning capacity in a lifestyle medicine clinic for adults with diabetes, pre-diabetes and unwanted obesity

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The ECAL indirect calorimeter is a simple and portable near testing device in use for 18 months in a GP surgery and the private Good Mood and Food Clinic in West Dorset. The test requires 4 hours of a water fast with no caffeine followed by

a 5 minute breath test through a plastic tube using a nose clip while the client is reclining. Results are immediately accessible for discussion with the client and include resting metabolic rate, mitochondrial function and an indication of metabolic flexibility or ability to burn fat while in the fasting state via respiratory quotient. A series of more than 50 clients using the testing equipment were asked for their feedback by means of a postal questionnaire including their personal experience of using the equipment and the information it provided them to guide their lifestyle choices with the aim of reducing weight, waist circumference and HBA1c levels and improving their metabolic function.

Disclosure
One meal paid for by MHS.

P29

Implementation fidelity of the OneLife Suffolk Integrated Healthy Lifestyle Service

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Background
It is recommended that process evaluations of intervention implementation and fidelity become an integral part of the conduct and evaluation of all health behaviour intervention research. Through the National Institute of Health's (NIH) Behaviour Change Consortium (BCC) framework for tailored health behaviour interventions, the current study aimed to evaluate implementation fidelity of the OneLife Suffolk Integrated Healthy Lifestyle Service (IHLS) with a view of better understanding its long-term sustainability in terms of feasibility and acceptability.

Methods
A convenience sample of 23 individual interviews and 5 focus groups took place. This resulted in a total of 47 (14 male) individuals comprising of key stakeholders ($n=18$), as well as OneLife Suffolk staff across senior management ($n=4$), team lead ($n=14$) and practitioner ($n=11$) roles. Individual interviews lasted between 21 and 60 minutes, and focus groups lasted between 37 and 50 min.

Results
A mixed degree of implementation fidelity was demonstrated throughout the service. Positive comments around practitioner motivation and rapport were echoed throughout the stakeholders, as well as OneLife Suffolk senior management, management, and team leads. Practitioners were described as fully engaged and motivated to deliver sessions due to their strong beliefs in the potential benefits of the OneLife Suffolk services to client's physical and psychosocial health. Contrastingly, practitioners themselves noted that they received minimal formal operational, data systems, clinical, and curriculum training and that this, along with a lack of personal development opportunities, affected their confidence in delivering sessions and collecting and analysing any data collected. Further negative comments were noted regarding integration between stakeholders and OneLife Suffolk IHLS staff. Specifically, a top-down approach to information dissemination regardless of position. This had a negative effect on OneLife Suffolk IHLS staff motivation and overall team moral.

Conclusions
Although a mixed degree of implementation fidelity was demonstrated, results provide valuable evidence to aid interpretation of overall programme findings and effectiveness and can be used to conceptualise best practices as a process to further strengthen the design, delivery and recruitment strategies of OneLife Suffolk IHLS and future behaviour change interventions.

Keywords
Evaluation, fidelity, intervention

P30

Craving control is the strongest psychological predictor of over-consumption in response to high energy density meals in women engaged in weight loss

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Background
It is generally accepted that loss of control of eating may undermine long-term weight loss. Given the wide availability of high energy dense (HED) foods in the obesogenic environment, it is important to identify individuals most susceptible to overconsumption of HED foods during weight loss attempts. This study examined psychological predictors of overconsumption in response to HED meals during a weight loss attempt.

Methods
Ninety-six women with overweight or obesity who had voluntarily enrolled in healthy eating-based weight loss programs were recruited [analysed $n=81$; 41.9 ± 1.4 years; 34.1 ± 0.4 kg/m^2]. Body weight was measured in weeks 1 and 14. After a two-week run-in period, resting metabolic rate (RMR) and psychometric eating behaviour traits were assessed (cognitive restraint, disinhibition, hunger, flexible, rigid, binge eating and craving control). Participants attended a day in the laboratory and were provided with fixed and *ad libitum* HED meals (>2.5 kcal/g). A fixed breakfast and lunch provided 50% of estimated individual daily energy requirements [estimated at $1.4\times$ RMR] and participants consumed an *ad libitum* evening meal and snacks. The percentage difference between total daily energy intake and estimated daily energy requirements determined overconsumption.

Results
On average participants overconsumed by $33\pm5\%$ (550 ± 88 kcal; 95% CI: 375, 725). Linear regressions showed that low craving control was the only psychometric trait that significantly predicted overconsumption ($R^2=0.20$, $P=0.04$). Overconsumption on the HED day ($\beta=0.23$, $P=0.005$) was a significant predictor of percentage weight change at week 14, alongside %weight change during the run-in period ($\beta=0.65$, $P<0.001$; $R^2=0.49$, $P<0.001$).

Conclusions
These findings highlight the importance of identifying individuals susceptible to food cravings and developing strategies to manage cravings for HED foods during weight loss attempts.

Keywords
Craving control, energy density, weight loss.

Disclosures

P31

The relationship between relative deprivation and access to bariatric surgery

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Introduction
Adults living in the most deprived areas of England are more likely to have obesity. However, it is not clear whether social deprivation has an impact on accessing and the outcomes of bariatric surgery. The aim of our study was to explore the effect of indices of deprivation on access to bariatric surgery and its outcomes.

Methods
Cross-sectional prospective evaluation in a single centre in England of all patients who underwent primary bariatric surgery in 2016. Deprivation was assessed using the index of multiple deprivation (IMD) (2015), which ranks areas within England from the most (IMD Decile=1) to least deprived (IMD Decile=10). We extracted lower-layer super output area IMD Deciles according to the patients post code at time of bariatric surgery as well as the 12-month post-surgical weight loss and type of surgery.

Results
Of the 183 patients who underwent bariatric surgery, 55% (n=102) lived in areas within the 1-3rd IMD Decile (most deprived areas) (27% (4-6th) and 17% (7-10th) IMD Decile). There was no relationship between the type of bariatric surgery offered and IMD Decile. There was no relationship between IMD Decile tertiles (1-3,4-7, 7-10) and % weight loss at one year either across all bariatric surgical interventions ($r^2=0.019$, $P=0.09$; $r^2=0.012$, $P=0.17$) or when analysed according to surgery type.

Conclusions
People undergoing bariatric surgery typically lived in more deprived areas which might be anticipated by the correlation between deprivation and obesity as well as

the relative levels of deprivation within our catchment area suggesting by this measure that deprivation is not a clear barrier to accessing bariatric surgery, however data was not available on patients who did not undergo surgery and this may reveal potential inequalities with accessing bariatric surgery both at the point of referral from primary care as well as in the transition from Tier 3 to Tier 4 services. Deprivation does not seem to have an effect on weight loss at 1 year post bariatric surgery. This data suggests that the bariatric surgery service is accessible to people across all IMD Deciles within our catchment area.

P32

Abstract withdrawn

P33

myfood24, an online 24h recall tool is a valid tool for measuring diet and may be useful in clinical populations

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Background
Robust assessment of the association between diet and health in population-based studies requires accurate and often repeated measurements of diet. The use of 24h dietary recalls can provide more accurate intake data than questionnaires, with reduced measurement error. Online dietary assessment tools can reduce administrative costs and facilitate repeated dietary assessment during follow-up in research or in clinical populations. We have developed an online dietary assessment tool, myfood24, undertaken validation comparing results to biomarkers and tested in clinical populations.
Method
A validation study recruited metabolically stable adults who completed myfood24, an interviewer administered multiple pass dietary recall and a suite of reference measures on 3 occasions. A further mixed methods study was undertaken to explore the feasibility and usability of myfood24 as a food record in a clinical population, women with gestational diabetes (GDM). Women were asked to complete five myfood24 food records, followed by a user questionnaire (including the System Usability Scale (SUS), a measure of usability), and were invited to participate in a semi-structured interview.
Results
In the validation study biomarkers were received from 212 participants. myfood24 gave broadly similar results to the more administratively burdensome interviewer-based tool. The online tool resulted in attenuation factors of around 0.2–0.3 which could have important effects on estimated risks. For example, if the true relative risk of a diet-disease association was 2.0, an attenuation factor of 0.3 would reduce the relative risk to 1.23. The clinical study recruited 199 participants with mean booking body mass index 29.7 kg/m^2, of these 121 women completed myfood24 at least once. The SUS was good at 71/100. Interviews

identified areas for improvement, including optimisation for mobile devices and as a clinical management tool.
Conclusion
The less burdensome use of the online tool, with automated nutrient coding and easy replication over a longer time period with associated gains in precision, makes it well-placed for repeated use in large-scale prospective studies and clinically. Ongoing work is exploring the use of myfood24 in clinical dietetic practice.

P34

Abstract unavailable

P35

Abstract withdrawn

P36

Long-term outcomes of attending a community weight management programme

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Background
There is a lack of data about the longer-term outcomes achieved by people attending community weight loss programmes, with the general perception that weight loss is not maintained. This study investigated the feasibility of contacting previous members of a commercial weight management organisation, Slimming World, to assess longer term (2.5–3 year) weight outcomes and explore their strategies for long-term weight management.
Methods
6299 adults with Derbyshire/Nottinghamshire postcodes, who joined Slimming World in the preceding 2.5–3 years, were invited to participate in a survey via email/post. Responses were matched with Slimming World membership records to verify previous weight data.

Results

378 individuals, aged ≤65 years, completed the survey and all 360 non-pregnant female (mean age 48.0 (10.7) years) responses were analysed. Mean weight on joining Slimming World was 90.0 (18.6) kg and BMI 33.3 (6.35) kg/m². At time of survey mean weight was 84.7 (18.8) kg and BMI 30.7 (7.22) kg/m², with mean weight loss of 6.4 (9.7)%. 87.2% were still aiming to lose weight. Half (50.6%) were still attending, or had re-joined Slimming World at the time of survey achieving a mean weight loss of 9.1 (10.2)% and BMI reduction of 2.3 kg/m². Of those currently attending, 86.3% were lighter than they were at the start of their weight loss journey with 25.7% between 5 and 10% and 44.3% > 10% lighter. Of those no longer attending, 74.2% were lighter than when they initially joined, with a mean weight loss of 4.2 (8.9)%. 17.4% were between 5-10% and 22.5% > 10% lighter. Behaviours/factors members felt contributed to losing weight and maintaining weight loss included eating more fruit/vegetables (72.5 and 48.6% respectively), using Slimming World recipes (59.8%, 38.2%), changing the way they cook (55.6%, 34%), regularly monitoring weight (53.9%, 26.7%), group support (52%, 30.9%) and increasing physical activity (38.5%, 24.2%). A smaller number felt family support was helpful (17.1%, 12.1%).

Conclusions

These findings demonstrate that Slimming World supports people in making healthy behaviour changes to enable weight loss and longer-term weight loss maintenance.

Keywords

Long-term, weight-loss, community weight management, behaviour change.

Disclosures

All authors work at Slimming World, Alfreton.

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P37

The association between resting metabolic rate and free-living daily energy intake is moderated by body fat percentage and is stronger in lean women than women with overweight and obesity

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Background

Previous research suggests that resting metabolic rate (RMR) is a determinant of self-selected meal size and 24-hour energy intake (EI) under laboratory and free-living conditions. However, whether the accumulation of adipose tissue weakens the coupling between RMR and EI has yet to be examined. The aim of this study was to examine if body fat percentage moderated the association between RMR and 24-hour EI in women across a range of body mass index (BMI).

Methods

74 women (age = 33.4 ± 10.2 y) were recruited and stratified using two *a priori* categories (lean-n = 27, BMI = 18.5–24.9 kg/m²; overweight/obesity-n = 47, BMI = 25.0–34.9 kg/m²). Body composition (air displacement plethysmography), RMR (indirect calorimetry) and 7-day free-living 24-hour EI (online food diary – myfood24.org) were assessed, and moderation analysis was conducted (PROCESS macro version 3.1) to examine the influence of body fat percentage on the association between RMR and EI. The EI/RMR ratio was calculated to assess whether reporting plausibility affected any observed associations.

Results

A positive association was observed between RMR and 24-hour EI ($r = 0.395$; $P < 0.001$), and this association was moderated by body fat percentage ($\beta = -2.310$; $P = 0.019$). The conditional effect of body fat percentage on RMR was statistically significant at the lowest (-1SD = 25.6%; $P = 0.0001$) and medium (mean = 36.7%; $P = 0.0003$) levels of the moderator, but not at the highest ($+1$SD = 44.4%; $P = 0.145$), suggesting that the association between RMR and 24-hour EI weakens with increased adiposity. There was no association between the EI/RMR ratio and body fat percentage ($r = 0.083$; $P = 0.482$), suggesting that the moderation effect was not influenced by reporting plausibility. Pearson correlation coefficient indicated that the association between RMR and EI was stronger in lean (body fat percentage = 26.4 ± 5.7%; $r = 0.554$, $P = 0.003$)

than in women with overweight and obesity (body fat percentage = 41.1 ± 5.6%; $r = 0.310$, $P = 0.034$).

Conclusions

Consistent with previous research, RMR was associated with free-living 24-hour EI, but these data further suggest that this association might be moderated by body fat percentage. As the association between RMR and EI was stronger in leaner individuals, the accumulation of body fat may be detrimental to an individual's ability to accurately match EI to energy requirements.

Keywords

Resting metabolic rate, energy intake, body fat percentage

Disclosures

None.

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P38

Quantification of true inter-individual variability in exercise-induced changes in body weight and composition and markers of appetite in individuals with overweight and obesity

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Background

There is increasing evidence that exercise training may facilitate weight management via improvements in appetite control. However, the meaningfulness of inter-individual variability in exercise-induced changes has recently been challenged.

Methods

This study examined the individual variability in body weight and composition, and markers of appetite in response to a supervised 12-week exercise intervention (2500 kcal/week) in inactive individuals with overweight and obesity ($n = 46$, 30 females/16 males; BMI = 30.6 ± 3.8 kg/m²; age = 43.2 ± 7.5 years) compared to non-exercising controls ($n = 15$; 9 females/6 males; BMI = 31.4 ± 3.7 kg/m²; age = 41.4 ± 10.7 years). Body weight and composition, hunger, daily food intake, food reward and eating behaviour traits were assessed at baseline and post-intervention. SD of the true individual response to the intervention (SD_{IR}) was calculated for each outcome. The mean body weight change and the individual response variability ($2 \times SD_{IR}$) was interpreted against a minimum clinically important difference of 2.5 kg. For other outcomes, the magnitude of SD_{IR} (standardized effect size; ES) was interpreted.

Results

The intervention produced a body weight loss of 1.8 ± 2.9 kg in Exercisers ($P < 0.001$), compared to a gain of 1.3 ± 1.6 kg in Controls ($P = 0.06$). The mean group difference (Exercise-Controls) in body weight was −3.1 kg (95%CI = −4.3 to −1.9 kg), with an SD_{IR} of 2.4 kg (95%CI = 1.4 to 3.1 kg), a clinically meaningful small-to-moderate effect (ES = 0.17, 95%CI = 0.10 to 0.22). In the Exercisers, there was also true exercise-induced individual variability in body fat percentage (ES = 0.22, 95%CI = 0.06 to 0.30), fat mass (ES = 0.21, 95%CI = −0.07 to 0.31), restraint (ES = 0.74, 95%CI = 0.45 to 0.95), susceptibility to hunger (ES = 0.46, 95%CI = −0.17 to 0.68) and binge eating (ES = 0.47, 95%CI = 0.23 to 0.63). For fasting and daily hunger ratings, food intake, food reward and disinhibition, both groups had a high degree of variability relative to the SD_{IR}, which suggests individual variability independent of the exercise intervention. Outcomes need to be interpreted with caution as sample size was small and uncertainty high.

Conclusions

These data suggest existence of true inter-individual variability in exercise-induced weight loss and some markers of appetite that was small to large in magnitude.

Keywords

Exercise, inter-individual variability, weight loss, body composition, appetite

Disclosures

None.

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P39

Is body mass index (BMI) associated with reaction time? Results from the UK Women's Cohort Study

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Background

While obesity has well known health implications there is limited research examining how it may influence cognitive function. The UK Women's Cohort Study (UKWCS) was established to explore links between diet and chronic disease. The cohort collected baseline data (1995 to 1998) using a postal questionnaire including a detailed FFQ. Phase 2 data were collected 4 years later (1999 to 2002), and included a 4-day food diary, 1-day activity diary and lifestyle questionnaire. The aims of this sub-study were to determine the acceptability of web-based cognitive function testing, and to establish cross-sectional associations between traits and components of successful ageing.

Methods

In 2010/11, a random sample of 2000 women, of the 35,000 in the UKWCS, who were cancer free, were invited to complete a questionnaire which included a personality assessment and an invitation to complete an online reaction time task (simple and choice reaction time) using a Flash-based method.

Results

Among 664 responders, 503 women were eligible including 102 women who were classified as overweight (25=30). Regression analysis adjusting for key confounders did not find any significant association between BMI and either simple or choice reaction times. Self-reported food intake differed by BMI, with red meat intake ($\beta = 1.38$, $P = 0.007$), processed meat intake ($\beta = 0.57$, $P < 0.001$), poultry meat intake ($\beta = 0.86$, $P < 0.001$), and total meat intake ($\beta = 2.92$, $P < 0.001$) were positively associated with BMI in this group. In addition, meat intake did not show an interaction with BMI in relation to reaction time.

Conclusion

BMI is not associated with reaction time as a measure of cognitive function in this population.

Keywords

BMI, reaction time, cohort

Disclosures

HZ is funded by a China Council Scholarship. JEC leads the UK Women's Cohort.

P40

Support Required to Maintain Weight Loss after an Initial Intervention: A Mixed Methods Study of Patients' Views

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Background

Theoretical health frameworks inform healthcare practice to enhance health changes. One such framework is the Attitudes, Social Influence and Self-efficacy (ASE) Model (De Vres, 1988). Whilst initial weight loss is achievable, maintenance of long-term weight loss is a goal that is difficult to achieve. Collaborative approaches between patients and healthcare professionals could help identify suitable & effective treatments. This study aimed to describe the views of patients attending an NHS weight management service with regard to the support needed to maintain weight loss after an initial intervention and how this may improve our weight management service.

Methods

Data was collected using a questionnaire and opportunistic sampling. Mixed-methods data analysis was used to align quantitative findings with deeper qualitative meanings. Twenty-five participants (17 female) were included with 17 participants completing a group intervention and 8 participants completed a 1-to-1intervention with a dietitian. Thematic analysis was used via an inductive approach. Data was coded manually then organised into main- and sub-themes.

Results

54% of participants identified losing weight as a main goal. 72% of patients lost weight (mean $\pm$ s.d. $= -2.71 \pm 2.87$ kg) and 16% of patients gained weight (mean $\pm$ s.d. $= 1.91 \pm 2.61$ kg). Overall, 80% of participants positively rated their weight loss, 82.6% positively rated their confidence levels to manage their weight and 100% of participants were satisfied with treatment received. Support emerged as a key theme in relation to support and keeping participants on track. Face to face support methods were positively rated and non- face to face support methods were negatively rated, regardless of previous treatment received. Thematic analysis identified 5 main themes linked to reaching goals and key learnings. These were achieving a healthy lifestyle, improving emotional well-being, intrinsic factors, extrinsic factors and self-management skills. Weight trajectory did not influence self-efficacy, the type of intervention was unrelated to preference of support technique and participants did not desire interaction via technological formats (e.g. telephone or email).

Conclusion

This research found readily available support and such support taking place in person is a main priority. More research could shed further light on these findings.

P41

Parental practices around feeding and exercise in children living with and without asthma

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Background

Asthma is one of the most common chronic illnesses in children and adolescents. A growing number of studies have found a correlation between asthma and an increased obesity risk. The mechanisms underlying the asthma-obesity relationship are unclear and likely to be multifaceted. As research suggests parents of children living with a chronic illness may adjust their parenting style, the role of the family environment should be considered. This present study explores the differences in parental practices around feeding and attitudes towards exercise in parents of children living with and without asthma.

Methods

Parents of children aged 10–16 years living with ($n = 319$) and without asthma ($n = 316$) were recruited. Data were collected online through validated questionnaire measures for: parental feeding practices, child eating behaviour, parenting practices of child activity, and child activity levels.

Results

The results indicated that children living with asthma had a significantly higher BMIz. Parents of child living with asthma were significantly more likely to use food to regulate their child's emotions, restrict their child's diet for weight control, and be concerned about child overweight. Parents of children living with asthma were also more likely to monitor and control their child's activity levels and to pressure their child to exercise. Child emotional overeating and desire to drink were higher in children living with asthma compared to their peers.

Conclusions

The results suggest that certain parenting practices around eating and exercise, which have been linked to excess weight, are more prevalent in families where children are living with asthma. Further exploratory analyses showed that the relationships between parental restriction of food for weight control and child BMIz was significantly moderated by asthma control, and that the relationships between child activity level and child BMIz was significantly moderated by asthma control. This suggests that the pattern of relationships between eating/exercise and child weight may differ according to children's asthma management and that asthma control should be considered when reflecting on child weight management in children who are living with asthma.

Keywords

Obesity, asthma, adolescence, parental practices

Disclosures

No potential conflict of interest to report.

P42

Abstract withdrawn

P43

Behaviour change and weight and outcomes in patients referred to a community weight management programme

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Introduction
Slimming World on Referral is a subsidised partnership between Slimming World and NHS and local government commissioners, providing a cost-effective, 12-week, weight management intervention. This analysis investigates the weight and behaviour change outcomes in patients referred to this service between 2014 to 2018.
Methods
Data from 21,149 patients who were referred to Slimming World for an initial 12-weeks and completed an evaluation questionnaire at the end of their referral (20.0% response rate) were collated. Weight and attendance data (from electronic records), changes in dietary and physical activity behaviours and ratings about the Slimming World group and information provided (from the questionnaire using 5-point Likert scales) were analysed.
Results
Mean baseline BMI and age were 37.3 ± 6.2 kg/m^2 and 50.4 ± 13.6 years, with 14.9% males. Mean weight change and number of sessions attended was $-6.5\% \pm 3.5\%$ and 10.3 ± 2.0, respectively. A clinically significant weight loss of $\geq 5\%$ was achieved by 67.2% of patients and 15.9% of patients achieved a weight loss of $\geq 10\%$. After attending Slimming World, patients reported cooking from scratch more (56.7%) and eating less takeaways/fast-food (65.7%) and were less likely to eat processed foods (62.6%). Almost two-thirds were more likely to eat 5 portions of fruit and vegetables per day (57.5%), which was associated with greater weight loss ($\beta = -0.41$, $P < 0.001$). Almost half of patients were less likely to watch television (49.6%) and less likely to avoid moderate or intense physical activity (54.3%). Patients also reported going out for walks more often (57.0%). The majority of patients found the Slimming World groups to be enjoyable and the information provided to be useful (mean ratings of 4.1 and 4.4, out of 5 respectively). The majority of patients reported that Slimming World improved the way they feel about themselves (mean rating of 3.9).
Discussion
Slimming World on Referral helped to support patients to adopt healthier dietary and physical activity behaviours and lose weight. Referral to Slimming World also led to an improvement in how patients felt about themselves.
Keywords
Weight management, behaviour change, referral, lifestyle intervention
Disclosure
All authors work at Slimming World.

P44

Perceptions on overweight and obesity among African migrant women living in the UK

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Background
Preventing obesity among women of reproductive age is a public health priority. African migrant women are high risk groups for maternal overweight and obesity in high-income countries. This study investigates the perceptions of African migrant women living in the UK on obesity, and factors influencing their weight status and weight-related behaviours.
Methods
Qualitative face-to-face interviews were carried out with African migrant women aged 18–45, who had lived in the UK for at least six months, and given birth within the last two years. Data were coded using NVivo and analysed using an inductive thematic analysis approach. Data coding was informed by the health belief model and theory of planned action; including coding for: participants' beliefs about obesity, factors influencing their weights, weight-related behaviours, intentions and actions.
Results
Fifteen women from Nigeria, Cameroon and Ghana were interviewed. These women believed that Africans are not at risk of developing obesity, and it is not a health issue they commonly talk about. Dietary and genetic factors were primarily described as causes of obesity, while physical activity (mostly interpreted as sport/vigorous exercise) was not an intrinsic part of their culture. Women believed that preconception weight didn't influence health/pregnancy. Meanwhile, pregnancy was associated with heightened weight-awareness. Challenges to maintaining healthy pregnancy weight included families encouraging weight gain; food cravings; unhealthy food in the UK and using pregnancy as an excuse to over-eat, with plans to lose weight postnatally. Midwives and relatives were useful information sources for pregnancy weight. Women found midwives' PA advice helpful, but could hardly remember dietary advice. Advice from friends and family was valued more. Despite cultural preference for 'bigger' women and stigma relating to small body size in the African society, most women desired weight loss and preferred smaller body sizes. Post-migration changes in weight perceptions were reported, including increased knowledge of healthy weight-related behaviours and awareness of unhealthy cultural practices.
Conclusions
Women's weight perceptions and behaviours were influenced by both back home and post-migration factors. Knowledge on preconception weight implications was lacking, while maintaining healthy pregnancy weight was challenging.
Keywords
Obesity, pregnancy, African, migrant

P45

The Influence of Taste Genetics on Food Preference and Intake in Adolescence - Systematic Review

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Background
Evidence-based studies have consistently reported differences in food choices, preferences, and intake in adults based on taste genotype, which may have a potential impact on health. However, the corresponding evidence on adolescents gets less attention. Understanding more about influences on food choice could support healthier diets and weight status in adolescents.
Objective
Our aim is to identify and review evidence investigating the impact of taste genotype on phenotype, including taste perception and sensitivity on food choices and dietary intake among adolescents.
Method
Systematic searches were conducted to identify English language articles testing the impact of taste genotypes on food choices, preference, and intake on healthy adolescents aged 13–18 years old. The search included all available study designs published between 1/1/2000 to 1/1/2019. The main outcome of this systematic review is the impact of taste genotype on food choices and preference, and dietary intake while the secondary outcome is the impact of taste perception on nutritional status and BMI. The review is still in progress.
Results
Approximately 30 studies met our inclusion criteria. The studies included both cross-sectional and case control. About 11 studies measured taste genotype while the majority carried out taste phenotype measures. Participants' age, in general, was $3+$ years old, with only a few studies were focusing precisely on the adolescent age range of 13–17 years old.
Conclusion
At this stage of our systematic review, studies reported lower intakes of some types of vegetables with bitter taste among 'taster' participants with a higher

preference of sweet food. In terms of weight and BMI, people who were 'tasters' of bitter compounds tended to have higher weight and BMI than non-tasters.

P46

Mind the Gap 2 – The effect of working memory training on the possible physiological and behavioural compensatory responses after weight loss: A study protocol

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Background
Roughly twenty percent of individuals who are successful at weight loss can successfully maintain the weight loss permanently. The physiological and psycho-behavioural compensatory responses to weight loss makes weight loss maintenance a rare phenomenon. In a preliminary study we found that successful weight loss maintainers have higher executive function, higher eating restraint and adhere to higher levels of physical activity compared to lean individuals with no weight loss history, and women experiencing weight loss relapse. The proposed study stems from the latter findings. The study protocol investigates the role of working memory training on executive function and eating behaviour outcomes to determine its effectiveness as a strategy to prevent weight regain after weight loss.

Methods
Fifty apparently healthy women between the ages of 25 to 45 years will be non-randomly assigned to one of three groups in this prospective cohort study. Twenty women with obesity reporting weight loss will complete working memory training four times a week for six weeks additionally to following a self-developed educational programme that may aid weight loss maintenance. Fifteen women with obesity reporting weight loss will serve as the first control group who will only follow the educational programme, where fifteen women without obesity (no weight loss history) will serve as the second control group. Pre- and post-intervention; a series of assessments will include: eating behaviour questionnaires (Emotional Eating, Three factor eating questionnaire, LFPQ, self-control, weight efficacy); Executive function and working memory; metabolic rate; and hunger and satiety before and after meal ingestion.

Results
The results will reveal the association between possible changes in executive function and changes in eating behaviour, perceived hunger and satiety. Additionally, the latter changes will also be compared to physiological changes of metabolic rate, hunger and satiety.

Conclusions
The study may support evidence that working memory training can be an effective strategy to combat possible compensations to weight loss and prevent weight regain in people who have lost weight.

P47

DNA methylation biomarkers of early life rapid weight gain: Findings from the Newcastle Thousand Families Study and the Avon Longitudinal Study of Parents and Children

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Background
The associations between early life factors and obesity in later life may be mediated through epigenetic mechanisms such as DNA methylation. Infancy rapid weight gain (RWG) is one early life factor that has been consistently associated with increased risk of obesity in childhood. We investigated if early life rapid weight gain ($+0.67$SD change in weight for age z-score from birth to 1 year), was associated with variation in DNA methylation in childhood and adulthood.

Methods
An epigenome-wide association study was run using Illumina 450K array data from the Avon Longitudinal Study of Parents and Children (ALSPAC), examining early life rapid weight gain (RWG) and blood methylation (in childhood and late adolescence) at individual CpG loci. RWG was associated with a 1% increase in methylation at an individual CpG loci (cg11531579) in childhood (age 7, $n=116$) in ALSPAC (Bonferroni corrected for multiple comparisons).
The significant CpG (cg11531579) was investigated further in an older population to examine whether the associated variation in blood methylation persisted into adulthood, using the Newcastle Thousand Families study (age 50, $n=134$). Combined bisulphite modification and pyrosequencing was used to assess DNA methylation.

Results
RWG was also associated with methylation changes in an adult population, although in adults this was a decrease in methylation (-2%, age 50) for those who had RWG in infancy (age 60, $n=91$).

Conclusion
This study identified that RWG in infancy is associated with small variations in methylation. The loci was positively associated with blood methylation in childhood but negatively in adulthood, The findings may suggest it is an irregular, dynamic, RWG-related loci.

P48

To what extent does contamination affect a feasibility trial evaluating a public health intervention?

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Background
Health, Exercise and Nutrition for the Really Young (HENRY) is a public health intervention developed to address the challenges of children living with obesity. A feasibility trial is ongoing into its effectiveness. Pre-existing literature highlights the need to consider the presence and effects of contamination between the research and control group in intervention studies.

Objectives
To investigate the ways and means of contamination in a childhood health intervention trial, (HENRY), and to consider the effects of any contamination.

Methods
This qualitative study involved focus groups and semi-structured interviews conducted at the same children's centre where HENRY had been delivered. Children's centre staff acted as gatekeepers, assisting with participant sourcing. Data was transcribed and thematically analysed. Ethics was obtained from Leeds University Research Ethics Committee.

Results
Data was collected from four focus groups of parents (including those who had and had not attended HENRY), and via semi-structured interviews with 16 parents and six members of centre staff. The amount of reported sharing of information by parents was variable. A number of mechanisms of contamination were found, which included social media, face-to-face, children's centre programmes and staff and parent information sharing. However, sharing of information was usually only as a result of being asked for advice and the degree to which sharing impacted on behaviour change was not clear.

Conclusions
Results complement previous literature that contamination occurs in intervention studies. Recommendations are suggested for future studies to consider the extent, nature and effects of contamination on the results of their intervention.

P49

A physical activity intervention among community groups of older women in socio-economically disadvantaged areas: randomised feasibility study

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Background
Physical activity (PA) is an effective method of weight management. However, engagement in PA decreases with age, particularly among women who live in socio-economically disadvantaged areas and have a high risk of obesity. The use of existing social networks may offer a way to engage 'hard-to-reach' populations in PA interventions, but research is sparse. Using the Medical Research Council guidelines for complex interventions, we developed and tested the feasibility of a PA-promoting intervention for older women within existing community groups in socio-economically disadvantaged areas.
Methods
Participants ($n=40$) were recruited from older (aged ≥ 50 years) women's groups from four different community centres. A 12-week programme was delivered using a parallel-group delayed intervention design during existing group sessions, informed by Social Practice Theory. Sessions provided education about PA, facilitation of social support (PA 'buddy', group discussion and follow-up telephone calls), and printed information about local PA opportunities. The study investigated rates of participant recruitment, retention, and completion of PA (accelerometry) and assessed mental health (Hospital Anxiety and Depression Scale (HADS)) at four time-points. Intervention acceptability was assessed by questionnaire and participant focus group interviews, using framework analysis.
Results
Recruitment was high; 87% (40/46) of women attending the groups consented to participate, and 78% (31/40) attended all education sessions. Few participants provided valid accelerometer data (20%; 8/40) at all follow-up time-points, but 63% (25/40) completed all HADS questionnaires. The informal delivery of education sessions and printed materials were viewed positively, but telephone calls and 'buddy' support had low uptake and were not valued. Whilst participants disliked wearing a waist accelerometer, they thought that regular PA feedback would facilitate useful goal-setting. They perceived that organised group activities would encourage increased PA engagement.
Conclusions
High recruitment and retention rates suggest that using existing social support groups is an attractive and acceptable method of delivering a health promotion intervention to this population, which could assist with weight management. A randomised controlled trial appears feasible, with refinement of the social support component, facilitation of goal-setting, reconsideration of PA assessment methods and inclusion of weight measurement.
Keywords
Community-based, older women, physical activity
Disclosures
None.
DOI: 10.1530/obabs.1.P49

P50

'It's got adverts… Always, always there' – Change over time in the impact of junk food marketing on children and young people's dietary behaviours

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Background
Marketing for food and drinks high in fat, salt and sugar (HFSS) are known to negatively influence dietary-related knowledge, attitudes and health outcomes such as overweight and obesity. It is crucial to address the alarming UK childhood obesity rates; a child with obesity is five times more likely to become an adult with obesity, and overweight and obesity causes 13 types of cancer. Digital marketing is now as, or more, prevalent in young people's lives than TV advertising. More evidence is needed to understand the mechanisms by which the influence of HFSS marketing occurs, and to underpin policy action to ensure marketing regulation is fit for purpose in the current marketing landscape.
Aims
To explore trends over time in children and young people's dietary perceptions and attitudes and behaviours across all forms of HFSS marketing, particularly digital.
Methods
A nationally representative online cross-sectional UK survey of 11–19 year olds ($n=3286$), is being performed. This survey builds on the first wave of the YOPS (conducted in 2017), updated to reflect the 2019 policy context and to focus specifically on digital HFSS marketing. A qualitative scoping study of focus groups with 11–19 year olds was conducted by ScotCen to inform survey design for the digital HFSS marketing component. Survey recruitment is being conducted by YouGov through their online panel. Linear regression will be performed, controlling for demographic factors, to test for associations between different forms of HFSS marketing exposure and HFSS consumption. Data collection will be complete by August 2019.
Results
Data will give self-reported consumption of HFSS products, HFSS marketing exposure across platforms, and digital media use and engagement. Results will provide insight into whether the impact of HFSS marketing has changed over the past two years, and build the evidence on the impact of digital HFSS marketing.
Discussion
This study builds a picture of how the impact that HFSS marketing has on children and young people's dietary-related behaviours and health outcomes may have changed over time. It will explore the link between digital marketing and young people's dietary behaviours, and support policy-making around HFSS marketing regulation.
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P51

Abstract withdrawn

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P52

Development and evaluation of a pilot educational intervention to improve older adults' understanding of current UK nutrition labels

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Background
New, mandatory nutrition labels were introduced in the UK from 2014 and are intended to help reduce obesity levels via consumers' food choices. A key antecedent to consumers' label use is their understanding of this information which varies according to label format and declines with age. To help consumers to understand and use nutrition labels, education is required in labelling legislation. However, evidence of the effect of education on consumer's understanding of nutrition labels is lacking in the UK. In addition, there is a need to support older adults' use of nutrition labels given that obesity levels are highest among the 55–74 year old age group. The aim of this study was to develop and evaluate a pilot educational intervention which targeted older adults' understanding of current UK nutrition labels.

Methods

Intervention development and session learning objectives were based on earlier research into older adults' levels of understanding of the new UK back and front-of-pack nutrition labels. The effect of the educational intervention on understanding of nutrition labels and related characteristics was assessed at pre and post-intervention using questionnaires and quiz items.

Results

Following ethical approval, a cohort of 31 community service-users (median age 56 years) consented to participate in a 1-hour education session advertised as about 'food labels'. The session was led by a dietitian and included hands-on tasks and a short video. Mean quiz scores out of a maximum of five were low at pre-intervention (mean score $=1.7$, S.D. 1.8). However, understanding significantly improved (mean score $=3.2$ S.D. 1.7) at post-intervention (MD$=1.4$, 95% CI: -2.1, -0.8, $P < 0.001$) along with participants' confidence in use of nutrition labels to make healthier food choices (using a 7-point scale, MD $=1.4$, 95% CI: 0.7 to 2.1).

Conclusions

This pilot study shows the feasibility and potential of a brief education session to support improvements in understanding of UK nutrition labels in older adult community service-users. Future UK research is required, at scale, to confirm the effects of such education on participants' nutrition label use and dietary intakes.

Keywords

Nutrition labels, older adults, education, intervention

Disclosures

None.

P53

Abstract withdrawn

P54

The acceptability of alginate containing pork sausages

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Background

The prevalence of obesity is rising globally among children and adults. Obesity accounts for significant morbidity, mortality and complicates chronic health conditions such as hypertension, several types of cancers and liver disease. Adipose accumulation is a reliable indicator of obesity. One approach to reducing adipose accumulation is lipase inhibition in the form of medication (Orlistat). However, the use of this drug is associated with adverse gastrointestinal side effects. There is evidence that brown seaweed and its extracted alginic acid and its salts can inhibit lipase. Thus, these could be explored as suitable options for obesity prevention.

Objective

The purpose of this study was to examine if the addition of alginate in pork sausage affected the acceptability and palatability. The second aim was to determine whether eating alginate pork sausage as a part of daily food contribute to GI well-being.

Design

A total of 35 participants (18 male and 17 female between 18 and 64 years of age), generally healthy without any chronic health conditions, non-smoker included a

novel alginate sausage into their normal diet had completed the study. These participants kept a food diary and completed a GI well-being questionnaire at the end of each day and once at the end of each study week during four weeks of the study. They consumed their normal diet in the first and third week and ate both control and alginate sausages in the second and fourth week. The first type of sausage was separated by a 1 week washout period.

Results

We demonstrated that alginate pork sausage had no adverse well-being symptoms on the participants. There was no significant correlation between consumption of alginate complemented pork sausage or control pork sausage on the daily average amount of nutrients consumed in calories, fat, fibre, protein, carbohydrate, sodium and sugar. Thus indicating acceptability of alginate pork sausage.

Conclusion

It is clear that both alginate and control pork sausages had no impact on the health of gastrointestinal well-being.

Keywords

Obesity, gastrointestinal (GI), alginate, pancreatic lipase.

P55

Anticipation of an acute 24 h period of severe energy restriction increases energy intake and reduces physical activity energy expenditure in the previous 24 h, in lean males

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Background

Intermittent fasting involves alternating between periods of severely restricted and unrestricted energy intake. Physical activity energy expenditure (PAEE) is reduced during, and energy intake is elevated after, a period of energy restriction, but whether these are altered in anticipation of energy restriction is currently unknown. The aim of this study was to assess whether energy intake and PAEE are altered in the 24 h before, as well as during and at the first meal following, a 24 h period of severe energy restriction.

Methods

In randomised, counterbalanced order, 14 lean males completed two trials spanning 3-days. Upon arrival on day 1, participants were informed which diet they would receive on day 2 of the trial; either an energy balanced diet providing 100% (2755 (159) kcal; EB), or an energy restricted diet providing 25% (691 (42) kcal; ER), of their estimated energy requirements. *Ad-libitum* energy intake was then determined at researcher-weighed breakfast (0830 h–0900 h), lunch (1230 h–1300 h), mid-afternoon (14:00–18:00) and dinner (1930 h–2000 h) meals. On day 2, participants were provided their allocated diet, consuming this outside the laboratory according to guidance provided by researchers. On day 3, *ad-libitum* energy intake was determined at breakfast (0830 h–0900 h). PAEE was measured throughout via integrated heart-rate and accelerometry monitors.

Results

Energy intake was 6% greater on day 1 (259 (92) kcal; $P<0.05$) and 14% greater at breakfast on day 3 (176 (59) kcal; $P<0.05$) during ER compared to EB. PAEE was 156 (67) kcal lower on day 1 ($P<0.05$) and 239 (105) lower on day 2 ($P<0.05$) during ER compared to EB. Excluding the study intervention, compensatory changes in energy intake and PAEE resulted in an 830 (123) kcal more positive energy balance during ER ($P<0.0001$), accounting for 40% of the energy deficit induced by the dietary intervention on day 2.

Conclusions

This study demonstrates that compensatory changes in energy intake and PAEE occur before, during and after an acute 24 h period of severe energy restriction, which favour the restoration of energy balance. Whether these changes remain with chronic intermittent fasting warrants further study.

Keywords

Intermittent fasting, energy balance, eating behaviour, physical activity

Disclosures

none.

P56

Developing a new Arabic Food Composition Database for an Online Dietary Recall Tool-myfood24

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Background

Assessing dietary intake is fundamental in providing quantification of consumed nutrients, which helps in evaluating nutritional status. Gulf countries, including Kuwait, United Arab Emirates (UAE), and Saudi Arabia, have been reported to have the highest prevalence of overweight and obesity in the world. However, food composition data for Middle-Eastern foods are limited, which emphasises the need for a comprehensive food composition database.

Objective

To develop a database of commonly food consumed in Middle East, specifically Saudi Arabia and Kuwait for inclusion in an Arabic version of the myfood24 online dietary assessment tool.

Method

The Arabic Food Composition Database was built using a systematic approach and from a number of sources: 1. Food composition tables (Kuwaiti's Composite Food Table, Food Composition for Use in the Middle East, Food Composition Tables for Arab Gulf Countries and myfood24 Food Composition Databases (FCDB)); 2. Food commonly consumed in Saudi Arabia and Kuwait found in published papers; 3. Back-of-Pack (BOP) nutrition information taken from major food venders in Saudi Arabia and Kuwait and 4. Recipes from local recipe books for common composite food not included in the identified databases. Complete nutrition information for each food was generated using the myfood24 FCDB Microsoft Access mapping tool. Arabic foods were allocated to similar generic products to fill in missing values of micronutrients. Macronutrient values for all composite and branded foods were taken from the original identified data and BOP food labels.

Results

The database includes 602 new food items. 157 composite food items from food tables, 74 BOP products from vendors in Saudi Arabia, 371 BOP from vendors in Kuwait. In addition, a further 1963 food items were selected from existing myfood24 Food Composition Databases to complete the current food database.

Conclusion

A representative food database of commonly consumed food in the Middle East has been created. This will be essential to characterise dietary intake in these populations.

Keywords

Food composition table, myfood24, composite food, Middle East

P57

Perceived role of the environment in causing obesity and support for government policies to tackle obesity: A systematic review with meta-analysis

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Background

There is currently low public support for a number of policies to tackle obesity. Some studies suggest that this low support is underpinned by the belief that the environment does not play a role in obesity. A failure to replicate these studies has led to uncertainty about whether changing this causal belief could increase public support. The current review is the first systematic synthesis of this evidence.

Methods

Five databases were searched: PsycInfo, Medline, Web of Science, Scopus, and Open Grey. Eligible studies were randomised controlled experiments that included an intervention group that provided information about the environment's role in obesity and measured support for policies to tackle obesity. The protocol was prospectively registered on Prospero (CRD: *CRD42018099764*). From 11,753 abstracts examined, 20 eligible studies were found ($N=8781$ participants).

Results

Random effects meta-analyses showed that communicating messages containing information about the environment's role in obesity had no meaningful effect on support for obesity policies when compared to a control group (SMD $=0.03$, 95% CI $[-0.02, 0.08]$, $P=0.206$). A further meta-analysis showed that these same messages did not change the belief that the environment causes obesity (SMD $= 0.01$, 95% CI $[-0.08, 0.09]$, $P=0.829$).

Discussion

Communicating information about the environment's role in obesity has no meaningful effect on the public's support for policies to tackle obesity. Given the messages used in these studies did not change the target belief, it remains unknown whether there is a causal relationship between this belief and support for policies to tackle obesity.

Key words

Causal beliefs, attribution, obesity, policy, attitudes

P58

The impact of diet on gestational diabetes mellitus incidence within distinct and diverse ethnic populations: A systematic review and meta-analysis

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Background

Gestational diabetes mellitus (GDM) is defined as the development of diabetes during pregnancy. While a small degree of insulin resistance is normal in pregnancy, GDM is detrimental to the health and development of both mother and child, increasing the mother's risk of 2 diabetes (T2D) and her offspring's risk of both T2Dand obesity in later life. GDM affects up to 1 in 7 pregnant women globally, but incidence varies among ethnic groups and is increasing worldwide. South Asian women are reported to experience some of the highest levels of incidence ($\approx 20\%$), twice that of white European women. Meta-analyses have shown dietary interventions as a promising means to control GDM during pregnancy; however, the extent to which these interventions are effective in different ethnicities remains unclear. Indeed, for T2D previous work has demonstrated significant ethnic-specific responses to diets aimed at improving glycemia in middle-aged women significant variation between ethnicities in their response to dietary interventions aimed at improving glycemia. Current meta-analyses within the literature include Randomised Control Trials (RCTs) to establish the effect of diet on GDM incidence. Within this meta-analysis, we utilize both RCTs and observational studies to ascertain the extent in which a women's diet pre-pregnancy in a non-controlled setting can impact GDM incidence.

Methods

Publications found within Pubmed and OVID databases were limited to cohort, nested-cohort, case-control, or RCT studies published after 2000 that report the association and effect of diet on diagnosed-GDM in healthy pregnant women. All titles, abstracts, and full-texts were reviewed in duplicate. Discrepancies were mediated by an independent 3rd reviewer. Extracted data were analysed using a random effect model and meta-regression, All studies were evaluated against the AMSTAR-2 criteria, including an assessment of risk of bias.

Results

Pending.

Conclusion

The aim of this work is to determine whether dietary interventions are an effective means of reducing GDM incidence in a broad range of ethnic populations and to what extent.

Keywords

Gestational diabetes mellitus, obesity, ethnicity

P59

Does eating behaviour mediate genetic susceptibility to a higher BMI among young adults?

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Background
Genotype has an effect on body weight that starts early in life and increases with time. Eating behaviour may be a mediator.
Methods
We used a 97 single-nucleotide polymorphisms (SNPs) polygenic score (PGS) to index genetic risk and the Adult Eating Behaviour Questionnaire (AEBQ), to measure 8 appetite traits among 2593 Avon Longitudinal Study of Parents and Children (ALSPAC), when they were on average 23.8 (standard deviation (S.D.): 0.5) years old. We used regression-based mediation analysis to estimate the extent each trait mediated the association between PGS and BMI at age 24.4 (S.D.:0.7). We used multiple imputation to impute missing BMI and covariates and adjusted for age, sex and 20 ancestry-informative principal components. We repeated our analyses, adjusting for parental socioeconomic position, BMI, depression, eating disorders, smoking and breastfeeding, as well as for offspring personality, depression, physical activity and smoking.
Results
In complete-case, minimally adjusted analyses, a 1 S.D. higher PGS was associated with a 0.934 (95%CI 0.7, 1.2) kg/m^2 higher BMI. A 1-unit higher score in emotional overeating, was associated with a 1.2 (95%CI 1.0–1.5) kg/m^2 higher BMI. Emotional overeating mediated 7.2 (95% CI 1–13.3) % of the overall association. Food responsiveness was associated with higher BMI and satiety responsiveness, slowness in eating and emotional under-eating were associated with lower BMI, but there was limited evidence of mediation (proportion mediated 1.9–2.5%, P 0.09–0.515). Results were similar for multiple imputation, most adjusted analyses.
Conclusions
Targeting emotional overeating may lower genetic inequalities and reduce BMI. The small proportion mediated by most traits suggests that genetic makeup acts through other pathways. Studies with repeated and more accurate appetite traits measures are needed to strengthen causal inference regarding their associations with BMI.

P60

Early pregnancy maternal adiposity measures and adverse pregnancy outcomes: A systematic review

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Background
Observational studies demonstrate significant associations between pre-pregnancy obesity (defined as BMI $\geq$ 30 kg/m^2) and adverse pregnancy outcomes (e.g. gestational diabetes mellitus [GDM]). Although BMI is a good indicator of population health, there is strong evidence in non-pregnant populations that it is a poor indicator of individual risk compared with alternative (e.g. waist circumference). There is a lack of comprehensive evidence on alternative measures to BMI in pregnancy. This systematic review aimed to identify associations between alternative measures of adiposity to BMI and pregnancy outcomes.
Methods
Ten electronic databases were searched in January 2019, supplemented by citation and reference list searches and contacting authors. Observational studies were included if they reported early pregnancy ($<$20 weeks) adiposity measures and any pregnancy outcomes. Studies were excluded if they were restricted to specific populations (e.g. women with PCOS), or were focussed on low adiposity/undernutrition. Screening, data extraction and quality assessments were carried out in duplicate. Assessment of suitability for pooling studies for meta-analyses is ongoing.
Results
Searches identified 78 studies that met the inclusion criteria ($n=84,962$ women). Studies were published between 1995 and 2019, and quality was rated as high ($n=44$) and medium ($n=34$). Studies were from Asia ($n=25$), North America ($n=21$), Europe ($n=19$), South/Central America ($n=5$), Australia ($n=4$), Africa ($n=3$) and multi-continent ($n=1$). Studies predominantly reported early pregnancy waist circumference. Additional adiposity measures reported were: circumferences (arm, thigh, calf, neck, wrist); ratios (waist:hip, waist:height, neck:thigh); skinfolds (tricep, bicep, supra-iliac, subscapular, abdominal); ultrasound (subcutaneous, visceral fat); and bio-impedence (fat/fat free/lean mass). The pregnancy outcome data predominantly related to GDM. Additional outcomes reported include birth weight/fetal growth, pre/post-term birth, pre-eclampsia, caesarean, perinatal death, neonatal ICU admission, and other maternal and perinatal conditions (e.g. anaemia, jaundice). Associations between BMI and pregnancy outcomes were reported by 47 studies which will enable a comparison to be carried out between the use of BMI and alternative measures in early pregnancy.
Conclusions
Synthesis is ongoing. The potential benefits of identifying accurate adiposity risk prediction measures include the development of more targeted and cost effective intervention for those women with increased risk.

P61

Patient reported experiences (PREMs) of engagement with an NHS weight management service for adults with obesity – content analysis of patient feedback collected using a short messaging service (SMS) application

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Background
High attrition rates undermine the effectiveness of weight management interventions (WMI). Up to 80% of participants prematurely cease their engagement with a WMI, but a comprehensive understanding of attrition remains elusive (Moroshko & Brennan et al, 2011). For greater insight, Lemstra & Bird (2016), call for more qualitative studies, however, a key challenge is recruiting active and former participants. The Office for National Statistics (2017), report that 95% of UK households own a mobile phone, therefore SMS represents a fast and inclusive form of data collection. The aim of this project was to explore PREMs of engagement in an NHS Adult Weight Management Service (AWMS), using a bespoke SMS application.
Methods
The Aneurin Bevan University Health Board (ABUHB) AWMS, collaborated with small/medium enterprise, 'Nudjed', to develop an innovative digital tool to gather PREMs using a SMS application. At 6-week intervals, patients received texts prompting them to quantitatively rate their experience based on a 5-point Likert scale, and provide a qualitative summary, the content analysis of which was performed using NVivo. This study was approved by the Risk Review Panel at ABUHB's Research and Development Department. All participants provided written consent.
Results
Over 18-months, 840 texts were received from 378 participants (22.0% men, 78.0% women). Combined, 'helpful', 'understanding', 'listened', and

'encouraging', were mentioned by 40.0% of participants and represented themes which were mostly positively reported. Combined, 'supportive', 'informative', 'advice', 'knowledge', and 'learning', were mentioned by 33.0% of participants. Some reported being happy with these aspects, however, many expected more tailored support, information and advice, suggesting that meeting individual needs and expectations is important for retention. Barriers to engagement centred around the waiting times between appointments, as combined, 'time', and 'waiting', were mentioned by 17.0% of participants.

Conclusions

Digital tools using SMS provides an effective platform to evaluate PREMs of engagement in WMIs. Patients valued the helpful, understanding, and encouraging environment provided by the AWMS, but many expected more personally tailored support and education to better manage their weight, and waiting times between appointments were also barriers to engagement.

Keywords

Weight management intervention, attrition, digital tool

Disclosures

No conflicts to declare.

P62

The impact of demographic factors such as gender in reducing BMI in children participating in a weight management intervention in the United Kingdom

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Background

BeeZee Bodies specialises in adult and child weight management and behaviour change and has been running in counties across the United Kingdom for almost ten years. The BeeZee Families Programme is an award winning healthy lifestyles programme designed for children who are identified as overweight/obese and their families. The Families programme incorporates behavioural economics, sociological factors and implementing our 'Habit before the habit' methodology to elicit real-life change, beyond the obvious factors influencing weight.

Methods

This study aimed to explore the demographic factors which affect the completion and BMI decrease in children on the BeeZee Families programme. Demographic and anthropometric data were analysed for 992 children aged 5–15 recruited between 2016 and 2019 from across Bedfordshire and Hertfordshire. Factors assessed include: gender, age, marital status, disability status, and quintile of deprivation (QOD), BMI, and waist circumference. Demographic variables were compared with BMI and, for completers, change in BMI during the programme. Data were analysed using SPSS Version 25.

Results

Of those who commenced theBeeZee Families programme, 78.1% completed, with 76.5% of completers decreasing or maintaining their BMI. On average, completers had a lower initial BMI than those who left the programme early ($P = 0.009$). Of those who completed, the fall in BMI was larger for males than for females ($P = 0.019$). These are preliminary results and more demographic factors will be further analysed, these demographic factors include the impact of deprivation, martial status, disability status and their relationship to programme completion and impact on BMI. This study is currently being conducted through a NIHR CLAHRC 2019 East of England fellowship.

Conclusions

Priority should be given to ensuring that children with high BMI complete the programme, and that girls who complete obtain greater benefit in terms of BMI reduction. More conclusions will be determined as further results are obtained.

Keywords

Adolescent, child, obesity, weight management, behaviour change

Disclosures

No conflict of interest or disclosure.

P63

Bariatric surgery is associated with reduced risk of the development and progression of foot disease in patients with type 2 diabetes: A matched controlled cohort study

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Objectives

Obesity is an established risk factor for diabetes peripheral neuropathy (DPN), peripheral vascular disease (PVD) and diabetes foot disease (DFD). Bariatric surgery (BS) is the most successful obesity treatment that results in sustained weight loss. However, the impact of BS in patients with Type 2 DM (T2D) on DPN and DFD is unknown. Hence, we conducted a population-based study examining the impact of BS on development and progression of DFD.

Methods

An age, sex, body mass index (BMI)- matched retrospective cohort study was performed using data from The Health Improvement Network (THIN), a UK electronically collected primary care patient records. Study period was 1 January 1990 to 31 January 2018. Adult patients with T2D and BMI $\geq$ 30 kg/m^2 were included in the study. The exposed group were patients who had BS after their T2D diagnosis; the unexposed group were patients without BS. The primary outcome was DFD (a composite of DPN, foot ulcer, Charcot's neuro-arthropathy, PVD, amputation or foot coded as moderate or high risk). Secondary outcomes was examining the progression of foot from low to medium and high risk. All variables were identified using Read codes. Cox regression was used to calculate hazard ratios using Stata version15.

Results

1126 exposed and 2219 unexposed patients were included. Mean (S.D.) age was 50 (9.3) years, 2261 (67.69%) were women, median follow-up was 3.6 years (IQR 1.7–5.9), median T2D duration for exposed vs unexposed was 4.7 (2.2–8.9) vs 4.6 (1.9–8.1) years. The mean (S.D.) preoperative HbA1c was 7.78 (1.82) % vs 7.82 (1.69) % in exposed and unexposed patients respectively. After adjusting for age, sex, smoking, alcohol, BMI, ethnicity, Townsend quintile (social deprivation), diabetes duration, baseline hypertension and HbA1c, BS was associated with reduced risk of developing DFD (adj HR 0.63, 95%CI 0.52–0.76, $P < 0.001$). BS was also associated with reduced risk of progression from low to moderate/high risk foot (0.87, 0.77–0.997, $P = 0.046$) and from moderate to high risk foot (adj HR 0.54, 0.33–0.90, $P = 0.018$).

Conclusion

In patients with T2D, bariatric surgery was associated with significant reduction in the risk of development or progression of foot disease.

P64

Oops...that's interesting! 4–8 year old children are *too* willing to taste vegetables, fruit and wholegrains in pilots of a small-group tasting activity

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Background

A diet based on fresh fruit, vegetables, and whole grains ('FVG') promotes healthy weight. However, few UK children consume the recommended quantity or variety. Dislike, especially for vegetables, is a major barrier to intake, and changing preferences is difficult. Our project will test effects of sensory food education in primary schools on willingness-to-taste ('WTT') FVG, as tasting is a necessary precursor of liking and dietary inclusion. Methodological pilots are currently ongoing, prior to intervention delivery.

Methods

Pilots are trialling a small-group WTT test activity. Children are free to taste (or not) from a selection of 10–12 FVG. They record their preferences with 'emoji'

drawings. FVG selection has included some common items (e.g. bell pepper), but mostly more unusual items (e.g. buckwheat, Sharon fruit, candy beetroot), so that most children encounter novel FVG.

Results

So far, of 69 children tested from two very different schools ($n=50$, $n=19$), 46 tasted all samples. Only 10% of all FVG samples presented were left untasted. Children mostly enjoyed tasting. Enjoyment and WTT were independent of liking, which varied markedly across the group. Children rated by parents as reluctant to taste new foods mostly followed the general trend to taste most or all samples. We'll present video recordings to demonstrate enjoyment.

Conclusions

Away from the emotion and pressure of the dinner table, in a fun group activity, children so far have been much more open to tasting FVG than expected. Ongoing work will clarify the robustness of this finding in a larger, more diverse participant sample. If this high baseline WTT is replicated in the main study participant sample, it would leave little margin for meaningful improvement post-intervention. Whilst challenging for the planned study, these (preliminary) findings suggest an interesting intervention approach to increase quantity and variety of children's FVG consumption. Namely a personalised approach, based on extending the range of known-liked FVG, given existing palates/preferences:

1. Tasting – provide fun, non-intimidating opportunities to taste many FVG.
2. Variety – identify new liked FVG.
3. Reinforcement - encourage children to take pride in, and request, their new likes.

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