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Effect of intermittent compared with continuous energy restriction on glycaemic control in patients with type 2 diabetes

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Intermittent energy restriction (IER) is a popular alternative weight loss method, however, to date, there are no long-term trials in patients with type 2 diabetes (T2DM). The aim of this trial was to investigate the effects of IER compared with continuous energy restriction (CER) on glycaemic control and weight loss in patients with T2DM over 12-months. One hundred and thirty seven (61 ± 9 years) overweight or obese participants (BMI 36 ± 6 kg/m^2) with T2DM (HbA1c 7.3 ± 1.3%) were randomised to either a 2-day IER diet (2100–2500 kJ/d), during which participants followed their usual diet for the other 5 days, or a CER diet (5000–6270 kJ/d) followed daily for 12 months. Medications likely to cause hypoglycemia were reduced at baseline according to the medication management protocol. Of the 137 randomised participants, 97 participants completed the trial. Intention-to-treat analysis showed similar reductions in HbA1c (−0.5 ± 0.2% CER, −0.3 ± 0.1% IER; P = .65) with a between-group difference of 0.2% (90% CI, −0.2% to 0.5%) meeting the criteria for equivalence (±0.5%). Weight change was similar between groups (−5.0 ± 0.8 kg CER, −6.8 ± 0.8 kg IER; P = .25) with a between-group difference of −1.8 kg (90% CI, −3.7 kg to 0.07 kg) which did not meet the criteria for equivalence (±2.5 kg). There were no significant differences between groups in changes to body composition, final step count, fasting glucose, lipids or total medication effect score at 12 months. Effects did not differ using completers analysis. Hypoglycaemic or hyperglycaemic events in the first 2 weeks of treatment were similar between groups (3.2 ± 0.7 events CER, 4.9 ± 1.4 events IER; P = .28), affecting 35% of participants using either sulphonylureas and/or insulin. Intermittent energy restriction is an effective alternative diet strategy for HbA1c reduction comparable to CER in patients with T2DM and may be superior for weight loss.

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Effects of time-restricted feeding on mood, hunger and fatigue

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Irregular feeding patterns have adverse effects on a variety of physiological and metabolic processes, independent of meal size and composition. Meal timing has a marked effect on health and can be manipulated to prevent and treat obesity as well as other metabolic disorders, especially in rodent models. Hunger and mood may influence dietary adherence and therefore the effects of dietary changes on psychological health should be considered. We tested the effects of time-restricted feeding (TRF) on measures of mood, hunger and fatigue.

Eleven sedentary males (age 38 ± 5 y; BMI: 32.1 ± 2.1 kg/m^2) completed two 5-day isoenergetic diet protocols in a randomised order, consuming three meals between 10:00–17:00 h (TRF; 8 h eating window) or between 07:00–21:00 h (unrestricted feeding, URF; 15 h). On the 5th day, participants attended the laboratory for 24 h and completed visual analogue scales hourly (07:00–22:00 h and 07:00 h) for hunger and fatigue and at four hourly intervals from 08:00 h for positive and negative mood states (Positive And Negative Affect Scale).

Ratings of hunger were altered across time (P < 0.001) and between conditions (interaction effect, P < 0.001), relative to the timing of meals. No differences in hunger between the conditions were found at 07:00 h on the fifth day or 24 h later. Ratings of fatigue increased across the day (P < 0.001) but not differently between conditions. Neither positive nor negative affect mood scores were changed by TRF. However, a main effect of order was observed, with increased negative affect scores in the second condition (P = 0.027); which may be due to the high study demands.

Short-term TRF had little effect on ratings of hunger, fatigue or mood states. TRF is a practical dietary approach and adherence to TRF over longer time periods may alter these psychological health and well-being factors.

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"It would definitely make you think twice, even after you've finished the drink, it's in your car, like the empty bottle, you'd look at it": Young adults' reactions to warning labels on the bottles of sugary drinks

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Introduction: On-bottle warning labels are a viable policy option, as part of wider efforts to reduce sugary drink consumption in Australia and around the world. There is very little research into which messages will be most effective among regular consumers. The aim of this study was to explore young adults' reactions to four types of warning messages: health effects, nutritional information, exercise equivalents, and pictograms.

Method: 16 focus groups with young adults (aged 18–24 years; n = 104) were conducted across four Australian locations (Adelaide, Sydney, Perth and Ballarat). Groups were segmented by sex and socio-economic status. Mock warning labels were presented to each group for discussion. Results were thematically analysed.

Results: Participants were confused about the sugar content of drinks. Many did not know how to interpret nutritional and exercise information, or how to contextualise and apply it to their own circumstances. Also, while aware of potential health risks, many participants perceived them as not personally relevant. On-bottle warning labels were found to help young adult consumers to 'stop

and think' about their own consumption. The results indicated that clear, factual, and non-ambiguous information was more persuasive. Sugar content pictogram labels were most persuasive.

Conclusion: On-bottle warning labels are a useful tool to help remind young adults of the potential consequences of overconsumption of sugary drinks. However, the content and execution of the label is important to delivering messages that are perceived as relevant, believable and to make them 'stop and think' about their own consumption.

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Frequency of price promotions on food in a major Australian supermarket chain: analysis by food category and relative product healthiness

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Introduction: Only 60% of food purchases come from supermarkets, with price promotion extensively used by retailers to influence consumer purchasing. The extent of price promotions in Australian supermarkets and how they differ by food category and overtime is unclear.

Methods: Weekly data on price promotions were collected online for one year (April 2017–April 2018) from the largest Australian supermarket. Over 1500 food items (healthier $n = 553$, less healthy $n = 990$) were included from the following categories: healthier = low-sugar breakfast cereals, packaged bread, muesli/oats, canned beans/legumes, frozen fruit and frozen vegetables; less healthy = high-sugar breakfast cereals, chips, chocolate, ice-cream and confectionery. Only temporary price promotions were considered. A multi-buy was defined as a promotion where more than one unit is purchased to receive the discounted price. The average proportion of products on price promotion each week and the average discount was calculated for each food category.

Results: On average, healthier food categories had 15% of products price promoted per week while less healthy food categories had 29% of products on price promotion. The categories with the highest proportion of products price promoted were chocolate (40%), chips (33%) and ice-cream (22%). The average discount was 15% on healthier categories, and 26% on less healthy categories. The largest price discounts were for chocolate (31%), ice-cream (27%), and chips (24%). Almost half of all multi-buy promotions were for multipack chips, with 60% of multipack chips available as a multi-buy promotion. Seasonal trends indicated that chips and ice-cream were more frequently discounted in summer, and confectionery more frequently discounted in winter.

Conclusion: Price promotions, including multi-buys, were both more prevalent and larger, for less healthy food categories. Policies to restrict price promotions on less healthy food items are likely to have a strong impact on purchasing patterns and thereby improve population diets.

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The potential cost-effectiveness of regulatory restriction on price promotions of carbonated sugary beverages in Australia

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Background: Restricting price promotions on unhealthy food and beverages to reduce their consumption has been identified as a promising approach for improving population diets. This study modelled the potential cost-effectiveness of national regulatory restriction on all price promotions (including sales and multi-buy offers) of carbonated sugary beverages, in Australia, from a limited societal perspective.

Methods: UK data on the uplift in sales of carbonated sugary beverages when price promoted, together with Australian consumption data (under the informed assumption that price promotions across the two countries are similar), was used to estimate reductions in purchases and resultant changes in body mass index (BMI) following regulatory restriction on promotions. A multi-state, multiple-cohort Markov model was used to estimate the long-term obesity-related health (estimated using health adjusted life years, HALYs) and cost outcomes over the lifetime of the 2010 Australian population. The costs of the intervention included the cost of passing legislation in Australian parliament, the cost of assisting retailers with implementing the policy, the cost of marketing the policy and the cost of monitoring retailers to ensure adherence to the policy. It was assumed that there was no cost to industry.

Results: The regulatory intervention resulted in a weighted mean change in daily energy intake of −12 kJ. This translated to a weighted mean change in weight of −0.11 kg, leading to approximately 2063 HALYs saved over the lifetime of the modelled population. Lifetime intervention costs were estimated to be AUD 17.0 million, with lifetime healthcare cost savings of approximately AUD 23.2 million. The intervention was likely to be dominant, resulting in long term cost savings and health benefits.

Conclusions: This analysis demonstrated that a regulatory restriction on price promotions of carbonated sugary beverages is likely to be highly cost-effective as an obesity prevention intervention.

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