

Obesity Digest

In this regular section, Matt Capehorn picks out recent key papers published in the area of obesity. To compile the digest, a PubMed search was performed for the 3 months up to 1st October using a range of search terms relating to obesity. Articles have been chosen on the basis of their potential interest to healthcare professionals and are rated according to readability, applicability to practice and originality.



Breakfast: Do we really know what advice to give?

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For many years the advice has been clear: if you have a decent breakfast, over the course of the day you are more likely to consume fewer calories overall and, therefore, it is better for weight management; in other words, “skipping breakfast can make you fat.” This has been based on findings from observational studies (van der Heijden et al, 2007).

A generation ago, “greasy fry-ups” fell out of favour because it was believed that the high saturated fat content automatically increased the risk of cardiovascular disease (CVD). Recent studies, however, call into question the role of dietary fat in CVD risk (Chowdhury et al, 2014). Perhaps the focus should have been on the excess number of calories being consumed, or on the high consumption of processed meats and the increased cancer risk this confers (Bouvard et al, 2015).

During this long period, cereal-based breakfasts, in particular those rich in whole grains and fibre, were marketed as being good for heart health. However, in reality, this led to a generation being brought up on a breakfast of ready-made cereals, often with a higher sugar content than a chocolate bar. This was then followed by the promotion of slow-release carbohydrates, such as porridge oats or, more recently, specially formulated and marketed breakfast biscuits. Have we ever really known how we should start the day?

In practice, we often see obese patients who report that once they “break the seal” on their eating, whether in the morning or at lunchtime, they find it difficult to control

their eating for the rest of the day. Whether this is a psychological or hormonal effect remains to be proven. However, the study by Chowdhury and colleagues summarised alongside demonstrates for the very first time that, in obese adults, extending the morning fast period does NOT result in a compensatory increase in food/calorie intake at an *ad libitum* lunch and, furthermore, nor does it increase appetite in the afternoon. The effect on satiety and appetite-stimulating hormone levels was also fascinating.

So, what recommendations can we make to our patients regarding breakfast? Clearly, in order to establish a definitive answer, more work needs to be done, and it may be that we have to individualise advice. In the same way that one weight loss intervention will not suit or work for everyone, breakfast may have effects specific to the individual. We do, however, need to remember that the concept of breakfast is to “break the fast” of not having eaten overnight. Physiologically, if we wake up “empty” we may need to refuel in order to work efficiently. Unfortunately, these days too many of us eat more than the recommended three meals a day and end the night having snacked for hours even after a sufficient evening meal, or we are in the habit of having a late supper. I therefore suspect that it is much rarer for people to wake up with a fast to break. Perhaps, instead of focussing on breakfast, we should turn our attention to evening eating patterns and retrain society to “scupper the supper” and avoid filling our bodies with fuel just before going to sleep. ■

Int J Obes (Lond)

Effects of skipping breakfast on subsequent energy intake at an *ad libitum* lunch

Readability	✓✓✓✓
Applicability to practice	✓✓✓✓
Originality	✓✓✓✓

1. Regular breakfast omission has been associated with increased risk of obesity, type 2 diabetes and heart disease; however, it is uncertain whether this association is mediated by increased compensatory energy intake later in the day or by hormonal responses.
2. In this randomised crossover study, the authors evaluated the effects of skipping breakfast on *ad libitum* energy intake in a subsequent pasta lunch and associated metabolic and hormonal responses in a sedentary laboratory environment.
3. A total of 24 obese adults (eight men and 16 women) of stable weight, around half of whom were regular breakfast eaters and half were not, were randomised either to receive a typical carbohydrate-rich breakfast comprising a mean of 521 kcal, or to fast until lunch. The assignments were reversed the next day.
4. Energy intake in the *ad libitum* lunch at midday was not significantly different in the fasting and breakfast groups. The additional intake at lunch in the fasting group accounted for only 10% of the calories omitted by skipping breakfast, resulting in a 459 kcal lower total daily intake in that group ($P < 0.01$).
5. In the fasting group, there was a trend towards lower appetite 3 hours after lunch, and there were hormonal responses that are generally associated with reduced satiety (reduced peptide tyrosine-tyrosine and leptin), as well as others that may contribute to reduced hunger (reduced ghrelin).

Chowdhury EA, Richardson JD, Tsintzas K et al (2015) Effect of extended morning fasting upon *ad libitum* lunch intake and associated metabolic and hormonal responses in obese adults. *Int J Obes (Lond)* 17 Aug [Epub ahead of print]

Int J Obes (Lond)

Effects of a high-protein vs. normal-protein breakfast on glycaemic control in adolescents

Readability	✓✓✓✓
Applicability to practice	✓✓✓✓
Originality	✓✓✓✓

1. In this pilot study, the authors compared the effects of consuming a high-protein (HP) or normal-protein (NP) breakfast on free-living glycaemic control in 28 overweight and obese, but otherwise healthy, adolescents who habitually skipped breakfast.
2. Both breakfasts contained 350 kcal; however, the HP variant was composed of 40% protein (35 g), 40% carbohydrate and 20% fat, while the NP variant had 15% protein (13 g), 65% carbohydrate and 20% fat.
3. Participants were randomised to receive one of the two breakfast types for 12 weeks and underwent continuous glucose monitoring for 24 hours both at baseline and at the end of the intervention.
4. In the HP group, but not the NP group, the 12-week intervention significantly reduced the peak glucose level (from 7.49 to 6.55 mmol/L; $P < 0.03$) and the time spent at glucose levels > 5.6 mmol/L (from 547 to 255 minutes; $P < 0.03$).
5. *Post hoc* analyses revealed that the HP breakfast significantly reduced the peak glucose response ($P < 0.01$) and postprandial glucose fluctuation ($P < 0.03$) compared with the NP breakfast.

Bauer LB, Reynolds LJ, Douglas SM et al (2015) A pilot study examining the effects of consuming a high-protein vs normal-protein breakfast on free-living glycaemic control in overweight/obese "breakfast skipping" adolescents. *Int J Obes (Lond)* 39: 1421-4

Int J Obes (Lond)

Little independent association between stress and obesity risk

Readability	✓✓✓✓
Applicability to practice	✓✓✓✓
Originality	✓✓✓✓

1. This large, observational, cross-sectional study evaluated the link between self-perceived stress and the risk of overall and central obesity in 125 290 people from 17 high-, middle- and low-income countries, including Canada, China and India.
2. After standardisation for age, gender, country income and urban/rural location, obesity was more common in people with permanent stress (defined as feelings of irritability, anxiety or sleeping difficulties as a result of conditions at work or at home) than in those with no stress (20.5% vs. 15.7%; $P < 0.001$), as was gender- and ethnicity-specific central obesity (52.5% vs. 48.6%).
3. However, after adjustment for age, sex, physical activity, education and region as confounders, no significant relationship between stress and obesity or central obesity remained.
4. There were statistically significant inverse relationships between stress and type 2 diabetes and hypertension; however, the effect sizes were very small.
5. The authors conclude that, while stress is linked to an increased risk of obesity, the association is weak and is mainly explained by regional variation in the two parameters.

Rosengren A, Teo K, Rangarajan S et al (2015) Psychosocial factors and obesity in 17 high-, middle- and low-income countries: the Prospective Urban Rural Epidemiologic study. *Int J Obes (Lond)* 39: 1217-23

N Engl J Med

Obesity severity increases cardiometabolic risk in children

Readability	✓✓✓✓
Applicability to practice	✓✓✓✓
Originality	✓✓✓✓

1. In this cross-sectional analysis of data from the US NHANES (National Health and Nutrition Examination Survey) study, the authors assessed the association between cardiometabolic risk factors and degree of obesity in 8579 children who were overweight or obese.
2. Using cut-offs of $\geq 85^{\text{th}}$ BMI percentile, $\geq 95^{\text{th}}$ percentile, $\geq 120\%$ of the 95th percentile and $\geq 140\%$ of the 95th percentile, participants were classified as being overweight (46.9% of the cohort) or class I (36.4%), class II (11.9%) or class III (4.8%) obese.
3. Multivariate models controlling for age, ethnicity and gender showed that increasing obesity severity was associated with lower HDL-cholesterol levels and higher blood pressure, triglyceride levels and HbA_{1c}.
4. Boys were at greater risk than girls, and risk increased in line with age.
5. These findings suggest that severe obesity increases levels of cardiometabolic risk factors even in children, and that obesity should be subclassified to aid identification of those at greater risk of cardiovascular comorbidities.

Skinner AC, Perrin EM, Moss LA, Skelton JA (2015) Cardiometabolic risks and severity of obesity in children and young adults. *N Engl J Med* 373: 1307-17

"The authors conclude that, while stress is linked with an increased risk of obesity, the association is weak and is mainly explained by regional variation in the two parameters."

Appetite

Adolescents do what their parents do, not what they say

Readability	✓✓✓✓
Applicability to practice	✓✓✓✓
Originality	✓✓✓✓

1. This study demonstrates that parental

dietary and exercise behaviours had a greater effect on the behaviours and subsequent weight loss than verbal instruction in overweight and obese adolescents ($n=100$).

2. Adolescents who perceived their parents to take regular exercise and eat fruit and vegetables every day were more likely to engage in these behaviours themselves over the 13-month follow-up, and these behaviours were in turn

associated with BMI reduction.

3. Conversely, parental advice to eat well and exercise had no effect on these behaviours or subsequent BMI.
4. The authors conclude that parental modelling and not pressure is likely to be the most effective way to help adolescents to lose weight. Targeted education of parents may be required.

Zarychta K, Mullan B, Luszczynska A (2016) It doesn't matter what they say, it matters how they behave: parental influences and changes in body mass among overweight and obese adolescents. *Appetite* 96: 47-55

References from commentary

Bouvard V, Loomis D, Guyton KZ et al (2015) Carcinogenicity of consumption of red and processed meat. *Lancet Oncol* 23 Oct [Epub ahead of print]

Chowdhury R, Wamakula S, Kunutsor S et al (2014) Association of dietary, circulating, and supplement fatty acids with coronary risk: a systematic review and meta-analysis. *Ann Intern Med* 160: 398-406

van der Heijden AA, Hu FB, Rimm EB, van Dam RM (2007) A prospective study of breakfast consumption and weight gain among U.S. men. *Obesity (Silver Spring)* 15: 2463-9