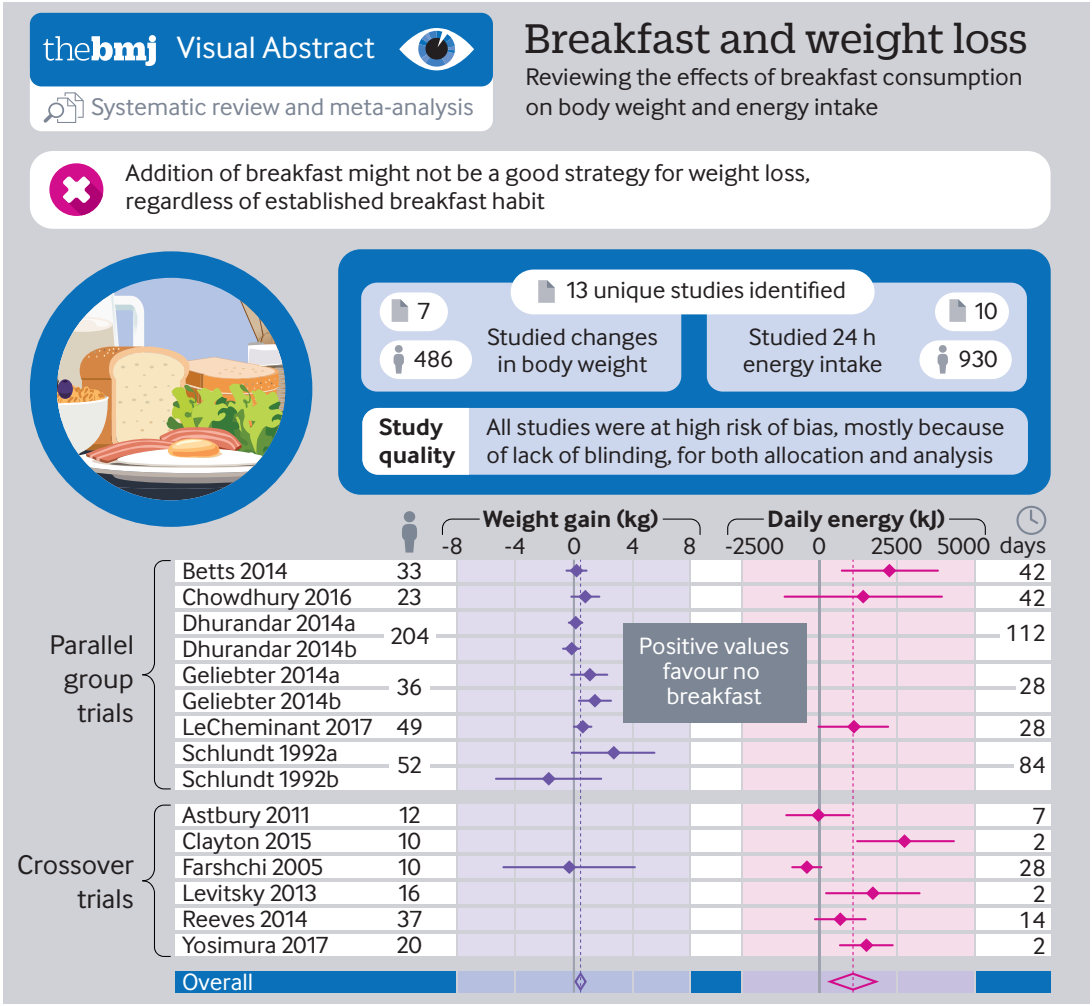
research

Eating breakfast might not help people control their weight p 185-7

Scribes increase doctors' productivity and reduce patients' stay p 188

Breakfast: a good strategy for weight loss?

A systematic review and meta-analysis (below and p 187) suggest that skipping breakfast does not necessarily lead to over-eating later in the day, as had previously been thought



BMJ OPINION Tim Spector

Breakfast—just another diet myth?

The mantra of breakfast being the most important meal of the day has been ingrained in most of us from an early age—from our mother's mouth as we were late for school to government campaigns to get us to "go to work on an egg."

Over the past 50 years we have been bombarded with messages extolling the health benefits of various processed cereals and porridge oats. The British fry-up is thought by many to be the country's main contribution to world cuisine.

We are told that breakfast helps our metabolism and that skipping it will make us much hungrier so we'll over-eat and put on weight. These are not just old wives' tales. They are clearly laid out in current Public Health England and NHS guidelines prepared by an expert scientific panel with input from the food industry. These are mirrored in many other national guidelines, as well as the lay press and websites across the world. But what if this is just another diet myth?

Diet myth debunked

The disadvantages of skipping breakfast have now been debunked by several randomised trials. A systematic review and meta-analysis by Sievert and colleagues includes 11 randomised trials of skipping breakfast performed to date. The studies varied widely in duration and quality, and seven looked at changes in weight as well as changes in energy usage.

The conclusions were the same as in recent, largely ignored qualitative reviews; namely, that no evidence supports the claim that skipping breakfast makes you gain weight or adversely reduces your resting metabolic rate.

Furthermore, reasonable evidence now suggests that skipping breakfast can actually be a useful strategy to reduce weight. Why has the specialty got it so wrong in the past? There are several possible reasons, linked to traditional beliefs about nutrition. We are told to eat little and often—"grazing" rather than "gorging" to avoid "stress" on the body from having to digest large meals, especially later in the day when glucose peaks are higher and metabolic rates lower. The rationale was based on multiple studies of small animals and a few short term studies in humans. The concept of over-compensation later in the day was correct, and people who skip breakfast do eat more lunch and slightly reduce their activity—but importantly not nearly enough to make up the lost energy intake.

No evidence supports the claim that skipping breakfast makes you gain weight

Flawed by bias

The other reason that experts were misled was because multiple observational studies have shown that obese and diabetic people skipped meals more often than thin people. This mindset became ingrained in nutritional dogma. But these observational studies were flawed by bias. People who skipped breakfast were more likely on average to be poorer, less educated, less healthy, and to have a generally poorer diet. Overweight people were more likely to try and diet, and after a binge were more likely to feel guilty and skip a meal.

Despite these flaws in the science and the steady increase in opposing evidence from randomised controlled trials, the idea that skipping meals is unhealthy has prevailed for decades. Not skipping breakfast is still part of NHS recommendations by Public Health England and one of its eight key healthy diet messages, part of the US Department of Agriculture diet guidelines for Americans, and the Australian Guidelines for Nutrition.

Another common argument by the pro-breakfast lobby is that as well as reducing obesity, breakfast is essential for the mental wellbeing of children, even if they are generally well nourished. Again the evidence is weak, largely observational, and likely biased in the same way as for adults.

Restricting eating times

Evidence is also accumulating that restricting eating times and increasing fasting intervals can help certain people to lose weight. Some of these recent developments that seem counterintuitive to traditional thinking make sense in the context of the importance of the gut microbiome on human health and metabolism. The community of 100 trillion gut microbes have a circadian rhythm and vary in composition and function in fasting and fed states. Although this is a young discipline, some data suggest that microbial communities could benefit from short periods of fasting. They, similar to us, might need to rest and recuperate, which could be important for gut health in humans.

Around a third of people in developed countries regularly skip breakfast, whereas many others (including myself) enjoy it. This does not mean that all overweight people would benefit from skipping breakfast. Some people are programmed to prefer eating food earlier in the day and others later, which might suit our unique personal metabolism.

"One size fits all," and prescriptive slow moving diet guidelines filled with erroneous information look increasingly counterproductive and detract from important health messages. While waiting for guidelines to change, no harm can be done in trying out your own personal experiments in skipping breakfast.

The British fry-up is thought by many to be the country's main contribution to world cuisine

GETTY IMAGES

Tim Spector, professor of genetic epidemiology, King's College London

Find the full version with references and competing interests on bmj.com/blogs

ORIGINAL RESEARCH

Systematic review and meta-analysis of randomised controlled trials

Effect of breakfast on weight and energy intake

Sievert K, Hussain SM, Page MJ, et al

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Find this at http://dx.doi.org/10.1136/bmj.l42

Study question What is the effect of regular breakfast consumption on weight change and energy intake, in people living in high income countries?

Methods PubMed, Ovid Medline, and CINAHL were searched for randomised controlled trials published between January 1990 and January 2018, investigating the effect of breakfast on weight or energy intake. ClinicalTrials.gov and the World Health Organization's International Clinical Trials Registry Platform search portal were also searched in October 2018 to identify any registered yet unpublished or ongoing randomised controlled trials. Trials of adults from high income countries comparing breakfast consumption with no breakfast consumption that included a measure of body weight or energy intake were eligible. Two reviewers extracted the data and assessed the risk of bias of included studies. Random effects meta-analyses of the effect of breakfast consumption on weight and daily energy intake were performed.

Study answer and limitations Of 13 included trials, seven examined the effect of breakfast consumption on weight and 10 examined the effect on energy intake. Meta-analysis found a small difference in weight favouring participants who skipped breakfast (mean difference 0.44 kg, 95% confidence interval 0.07 to 0.82), but there was some inconsistency across trial results (I^2=43%). Breakfast consumers had a higher total daily energy intake than breakfast skippers (259.79 kcal/day, 78.87 to 440.71; 1 kcal=4.18 kJ), although there was substantial inconsistency across trial results (I^2=80%). All of the included trials were at high or unclear risk of bias in at least one domain and had only short term follow-up; therefore, the findings should be interpreted with caution.

What this study adds This study suggests that the addition of breakfast might not be a good strategy for weight loss. Caution is needed when recommending breakfast for weight loss in adults. Further high quality trials are needed to examine the role of breakfast consumption in the approach to weight management.

No competing interests declared.

Full details on funding available on bmj.com.

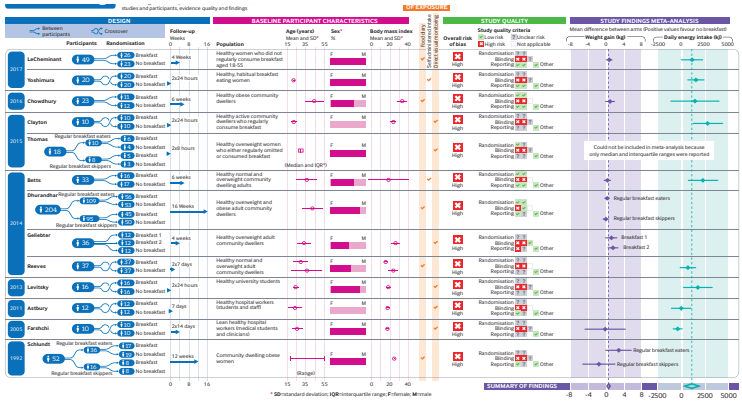
The data and statistical analysis code are available on the Open Science Framework: https://osf.io/sqgn9/.

Study registration PROSPERO CRD42017057687.

Random effects meta-analysis of mean difference in weight and total daily energy intake, based on breakfast consumption or no breakfast consumption

Trial author and year	Mean difference (95% CI)	Weight (%)
Weight change (kg)		
Parallel group trials		
Betts 2014	0.20 (−0.47 to 0.87)	14.95
Chowdhury 2016	0.80 (−0.14 to 1.74)	10.19
Dhurandar 2014a	0.12 (−0.33 to 0.57)	20.08
Dhurandar 2014b	−0.15 (−0.68 to 0.38)	18.10
Geliebter 2014a	1.06 (−0.14 to 2.26)	7.31
Geliebter 2014b	1.44 (0.38 to 2.50)	8.71
LeCheminant 2017	0.60 (0.03 to 1.17)	17.15
Schlundt 1992a	2.70 (−0.06 to 5.46)	1.73
Schlundt 1992b	−1.70 (−5.25 to 1.85)	1.08
Crossover trials		
Farshchi 2005	−0.30 (−4.71 to 4.11)	0.71
Overall (I^2=43.0%, P=0.072)	**0.44 (0.07 to 0.82)**	**100.00**
Total daily energy intake (kcal/day)*		
Parallel group trials		
Betts 2014	539.00 (172.98 to 905.02)	9.53
Chowdhury 2016	338.00 (−258.81 to 934.81)	5.79
LeCheminant 2017	267.00 (8.17 to 525.83)	11.84
Crossover trials		
Astbury 2011	−7.00 (−246.17 to 232.17)	12.28
Clayton 2015	654.00 (288.04 to 1019.96)	9.53
Farshchi 2005	−91.00 (−199.76 to 17.76)	14.80
Levitsky 2013	411.00 (56.05 to 765.95)	9.76
Reeves 2014	161.00 (−30.53 to 352.53)	13.30
Yoshimura 2017	362.00 (164.24 to 559.76)	13.17
Overall (I^2=79.5%, P=0.000)	**259.79 (78.87 to 440.71)**	**100.00**

Dhurandhar 2014a based on subset of participants who identified as breakfast eaters in general; 2014b based on subset of participants who identified as breakfast skippers in general. Geliebter 2014a based on comparison of cornflakes with no breakfast; 2014b based on comparison of porridge with no breakfast (sample size for the no breakfast group was halved in each comparison to avoid double counting). Schlundt 1992a based on subset of participants who identified as breakfast eaters in general; 1992b based on subset of participants who identified as breakfast skippers in general.
*1 kcal=4.18 kJ=0.00418 MJ.



NEW DATA VISUALISATION

The BMJ is using a new format for visualising summary of findings data in selected papers to give readers an overview of trials included in systematic reviews. The first such visualisation presents the data from the review on this page; accessed through the link below. It is based on the GOfER (Graphical Overview for Evidence Reviews) technique, developed by *The BMJ*'s data graphics designer Will Stahl-Timmins while studying for his PhD at Exeter Medical School.[1] *The BMJ* would appreciate feedback on the utility of this visualisation and suggestions for improvement. These can be posted as a rapid response online through the published article, or on Twitter #BMJinfographic.

1 Stahl-Timmins WM. Information Graphics in Health Technology Assessment (PhD thesis), University of Exeter, 2011. [https://ore.exeter.ac.uk/repository/handle/10036/4026]

Impact of scribes on emergency medicine doctors' productivity and patient throughput

Walker K, Ben-Meir M, Dunlop W, et al

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Find this at: http://dx.doi.org/10.1136/bmj.l121

Study question What are the changes in productivity and patient throughput when scribes are used by emergency physicians in emergency departments?

Methods This randomised clinical trial evaluated the effect of scribes at five emergency departments in Australia. A medical scribe is a trained clerical assistant for the doctor, who documents doctor-patient consultations at the bedside in real time (writing medical notes into the electronic record), arranges investigations and beds, finds people and information, and arranges appointments/sickness certificates/advice sheets. 88 emergency doctors worked with 12 competent scribes. Measurements included physicians' productivity (total patients, primary patients), patient throughput (door-to-doctor time, length of stay), and physicians' productivity in emergency department regions. Self reported harms of scribes were analysed, and a cost-benefit analysis was done.

Study answer and limitations Data were collected from 589 scribed shifts (5098 patients) and 3296 non-scribed shifts (23 838 patients) from November 2015 to January 2018. Scribes increased physicians' productivity from 1.13 (95% confidence interval 1.11 to 1.17) to 1.31 (1.25 to 1.38) patients per hour per doctor, representing a 15.9% gain. Primary consultations increased from 0.83 (0.81 to 0.85) to 1.04 (0.98 to 1.11) patients per hour per doctor, representing a 25.6% gain. Median length of stay reduced from 192 (interquartile range 108-311) minutes to 173 (96-208) minutes, representing a 19 minute reduction (P<0.001). No significant harm involving scribes was reported. The cost-benefit analysis showed a favourable financial position. The study was pragmatic, and limitations include enrolling only Australian sites and emergency consultants (not junior doctors), being unable to blind doctors and investigators to whether a scribe was present, and not measuring unrecorded overtime.

What this study adds Scribes increased physicians' productivity and reduced patients' length of stay, and a minor patient safety event was reported in one in 300 consultations. A financial cost-benefit analysis supports a scribe programme.

Competing interests, funding, and data sharing KW ran the scribe programme, and WD was a head scribe. Equity Trustees, the Phyllis Connor Memorial Fund, Cabrini Foundation, and Cabrini funded the study.

Medical researchers can contact KW for deidentified data.

Study registration ACTRN12615000607572 (pilot site); CTRN12616000618459.

Summary productivity and throughput data

All sites	Non-scribed	Scribed	Absolute differences	P value
Total patients	23 838	5098	–	–
Total shifts	3296	589	–	–
Mean (95% CI) primary patients/h/doctor	0.83 (0.81 to 0.85)	1.04 (0.98 to 1.11)	0.21 (0.16 to 0.27) increase	<0.001
Mean (95% CI) total patients/h/doctor	1.13 (1.11 to 1.17)	1.31 (1.25 to 1.38)	0.18 (0.12 to 0.24) increase	<0.001
Median (IQR) door-to-doctor time (min)	29 (11- 68)	29 (11-22)	No change	0.89
Median (IQR) length of stay (min)	192 (108-311)	173 (96-208)	19 min reduction	<0.001

IQR=interquartile range.