

Obesity Treatment

Cognitive and behavioural strategies for self-directed weight loss: systematic review of qualitative studies*

J. Hartmann-Boyce, A.-M. Boylan, S. A. Jebb, B. Fletcher and P. Aveyard

Nuffield Department of Primary Care Health Sciences, University of Oxford, Oxford, UK

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Address for correspondence: J Hartmann-Boyce, Nuffield Department of Primary Care Health Sciences, University of Oxford, Radcliffe Observatory Quarter, OX2 6GG, UK.

E-mail: jamie.hartmann-boyce@phc.ox.ac.uk

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Summary

Aim: We conducted a systematic review of qualitative studies to examine the strategies people employ as part of self-directed weight loss attempts, map these to an existing behaviour change taxonomy and explore attitudes and beliefs surrounding these strategies.

Methods: Seven electronic databases were searched in December 2015 for qualitative studies in overweight and obese adults attempting to lose weight through behaviour change. We were interested in strategies used by participants in self-directed efforts to lose weight. Two reviewers extracted data from included studies. Thematic and narrative synthesis techniques were used.

Results: Thirty one studies, representing over 1,000 participants, were included. Quality of the included studies was mixed. The most commonly covered types of strategies were restrictions, self-monitoring, scheduling, professional support and weight management aids. With the exception of scheduling, for which participant experiences were predominantly positive, participants' attitudes and beliefs surrounding implementation of these groups of strategies were mixed. Two new groups of strategies were added to the existing taxonomy: reframing and self-experimentation.

Conclusions: This review demonstrates that at present, interventions targeting individuals engaged in self-management of weight do not necessarily reflect lived experiences of self-directed weight loss.

Keywords: Qualitative, self-management, systematic review, weight loss.

Introduction

Overweight and obesity are a major cause of preventable morbidity and mortality worldwide, with the World Health Organization estimating that they cause at least 35.8 million disability adjusted life years and 2.8 million deaths annually (1). For these reasons and others, many adults try to lose weight: at any one time, over a quarter of American women are trying to lose weight (27%), with men not far behind (22%) (2). The large majority of adults trying to lose weight are doing so without professional input or a formal weight loss programme. However, in contrast to more intensive interventions (3–5), very little is known about self-directed efforts to lose weight.

It is widely recognized and accepted that increasing energy expenditure and decreasing energy intake (in effect, creating a negative energy balance) lead to weight loss in otherwise healthy adults. However, despite this seemingly simple formula, weight loss efforts are often unsuccessful, and in adults who manage to initially lose weight, weight regain is common, due in part to powerful biological and environmental forces. Therefore, the issue may not be *what* changes to make to diet and physical activity, but *how* to ensure people manage to make these changes and sustain them in the long term. Current research focuses on how poor diet and lack of activity cause disease (6,7), but we know much less about how changes in these behaviours can be initiated and maintained – in particular, very little

is known about the cognitive and behavioural strategies that influence these behaviours, which can include elements such as self-monitoring, strategies to boost motivation and social support, among others.

As a first step in developing further understanding of this area, we created a taxonomy of these cognitive and behavioural strategies, called the Oxford Food and Activity Behaviours (OxFAB) taxonomy (8). To date, this has been used to categorise the content of self-help interventions for weight loss as part of a quantitative systematic review and meta-analysis, and has been translated into a questionnaire and used in a cohort study to examine the relationship between use of these strategies and weight change trajectories in British adults trying to lose weight (9,10). To our knowledge, no systematic reviews currently review qualitative evidence specific to self-directed weight loss and weight loss maintenance. This review of qualitative literature is therefore a crucial further component to understanding the cognitive and behavioural strategies used by overweight and obese adults in weight loss attempts. The review aims to:

- examine the strategies people employ as part of self-directed weight loss attempts;
- test the current version of the OxFAB taxonomy against narrative descriptions of weight loss, refining and adding new terms if warranted; and
- explore attitudes and beliefs surrounding the implementation of these strategies as part of self-directed efforts to lose weight.

Methods

Details of the protocol for this systematic review were registered on PROSPERO prior to work commencing (11).

Search

Seven electronic databases were systematically searched in December 2015 (CINAHL, EMBASE, MEDLINE, PsycINFO, Science Citation Index Expanded, Social Science Citation Index, Conference Proceedings Citation Index – Science) for qualitative studies using terms related to qualitative research methodologies, obesity, weight loss, diet, exercise, behaviour change and self-care. Search terms for obesity, behaviour change and self-care were adapted from a recent systematic review of self-help interventions for weight loss, (8) and search terms relating to qualitative methodology are those proposed by the Cochrane Collaboration (12). MEDLINE search terms are listed in full on PROSPERO (11). Reference lists of included studies and relevant systematic reviews were also screened for further studies.

Inclusion criteria

The SPICE framework (settings, participants, interest, comparison, evaluation) was used to define inclusion criteria (13). Settings included community and primary care, and participants included adults (18 or older) who had attempted or were attempting to lose weight through behaviour change. Studies exclusively in people with anorexia nervosa or bulimia nervosa were excluded. The interest was those strategies used by participants in self-directed efforts to lose weight, defined as identifiable and unique behaviours or cognitions designed to help participants achieve weight-loss targets or adhere to diet or physical activity targets explicitly undertaken in an effort to lose weight. We did not extract other outcomes and did not include studies evaluating participants' experiences with, or opinions of, specific weight loss interventions (e.g. programme evaluations), as the aim of this review was to focus exclusively on self-management, including those strategies used by individuals that may not be advised by standard self-help information or be deemed acceptable in a trial context. We did not restrict studies on the basis of comparisons, and included only qualitative studies, e.g. interview, semi-structured interview, open-ended surveys and focus groups. Non-English language articles were excluded. There were no restrictions on publication date or country.

Screening and data extraction

One reviewer screened titles and abstracts for inclusion, with a sample of 10% checked by a second reviewer. The agreement rate was 100%. Full text was screened by one reviewer. Data extraction was conducted independently by two reviewers for all included studies using an adapted version of the QARI (qualitative report data extraction) form developed by the Joanna Briggs Institute for Evidence Based Practice (14). The form was piloted before use by two reviewers and amended as necessary. Data extraction consisted of three main components: study characteristics (including research aims, methods, setting and participant details), quality assessment (using the Critical Appraisal Skills Program [CASP] for qualitative studies (15)) and self-management strategies. Discrepancies were resolved by discussion or, where necessary, through referral to a third reviewer.

Self-management strategies were extracted using a modified framework approach (16,17). Two reviewers independently identified cognitive and behavioural strategies for weight loss in the included studies and coded these against a checklist of previously identified domains of strategies (8). Where present, reviewers also extracted data relating to use of self-management strategies more generally, or relating to cognitive and behavioural strategies for weight loss which were not included in the first version of the OxFAB taxonomy (Table 1).

Table 1 OxFAB taxonomy domains and definitions

| Domain | Definition |
|--|---|
| Energy compensation | Conscious adjustment of behaviours to alter energy intake and/or expenditure to control weight in light of previous energy intake or expenditure |
| Goal setting | Setting of specific behavioural or outcome target(s) |
| Imitation (modelling) | Emulating the physical activity or dieting behaviour of someone who you have observed |
| Impulse management: Acceptance | Respond to unwanted impulses through awareness and acceptance of the feeling that generates the impulse and reacting without distress or over-analysis |
| Impulse management: Awareness of motives | Respond to unwanted impulses by evaluating personal motives behind that impulse before acting |
| Impulse management: Distraction | Respond to unwanted impulses through distraction in an attempt not to act on the impulse |
| Information seeking | Seek specific information to enhance knowledge to help manage weight |
| Motivation | Strategies to increase the desire to control weight |
| Planning content | Plan types of food/physical activity in advance of performing behaviour |
| Scheduling of diet and activity | Plan timing and context/location of food/physical activity in advance of performing behaviour |
| Regulation: Allowances | Unrestricted consumption of or access to pre-specified foods or behaviours |
| Regulation: Restrictions | Avoid or restrict pre-specified foods, behaviours or settings |
| Regulation: Rule setting | Mandate responses to specific situations |
| Restraint | Conscious restriction over the amount that is eaten |
| Reward | Reinforcement of achievement of specific behaviour or outcome through reward contingent on the meeting of that target |
| Self-monitoring | Record specific behaviours or outcomes on regular basis |
| Stimulus control | Alter personal environment such that it is more supportive of target behaviours (adapted from CALO-RE) (18) |
| Support: Buddying | Perform target behaviours with another person |
| Support: Motivational | Discussing, pledging, or revealing weight loss goals, plans, or achievements or challenges to others to bolster motivation |
| Support: Professional | Seek help to manage weight from someone with specific expertise |
| Weight management aids | Use of and/or purchase of aids to achieve weight loss in any other manner (includes ingested agents such as medications, over-the-counter products and supplements; also includes exercise equipment) |

Analysis

Verbatim text on self-management strategies was coded using NVivo 11 (19). This included both direct quotes from participants as well as authors' summaries and interpretations of data. Where studies yielded strategies that had not yet been identified in the taxonomy, these were used to expand the framework through the addition of new index terms and/or top level categorizations (domains). This analysis was based on the principles of the thematic synthesis approach, set forth by Thomas and Hardern (20) and detailed by Major and Savill-Baden. (21) Thematic synthesis draws on the methods used in thematic analysis of primary sources, extending them for use in systematic reviews and consists of three analytical steps: identifying and analysing first order themes (through line by line coding), synthesising second order themes (through organizing free codes into related areas to construct descriptive themes) and interpretation of third order themes (the development of analytical themes). Two reviewers independently inductively and deductively coded data on self-management strategies. In instances where it was unclear how to code strategies against the initial framework, the strategies were discussed in consultation with a further two reviewers to reach consensus on whether a new domain should be formed or whether an existing domain should be expanded. Findings are synthesised narratively.

Results

Search results

Excluding duplicates, searches yielded 2,284 references (Fig. S1). After full text screening, 36 references, representing 31 studies, were included. Of these, six were unpublished theses. The most common reason for exclusion at full text stage was that the study was an evaluation of a specific weight loss programme, rather than focussed on self-directed weight management efforts.

Characteristics of included studies

Details on key individual study characteristics can be found in Table 2. An overview is provided in the succeeding texts.

Methods

Of the 31 included studies, seven used focus groups and 22 used one-to-one interviews, alone or in combination with other methods. The final two studies used web content as the basis for analysis: one collected data from a web forum on weight loss linked to a popular male magazine and the other collected data from a weight loss blogging website, and also administered qualitative surveys to bloggers. In terms of methods for analysing data, six used a form of

Table 2 Characteristics of included studies

| Study ID | Country | Focus | Inclusion criteria | N | Mean age | % female | mean BMI | SES | Ethnicity |
|------------------------|----------------------|--|---|----|----------|----------|----------|---|------------------|
| Abolhassani, 2012 (31) | Iran | Barriers and facilitators to weight gain and loss | Unsatisfied with current weight, tried to reduce weight at least once. Excl. lack of interest, dialect/language differences, limitations and inability to speak | 11 | NS | NS | NS | Eight employed, no other detail provided | NS |
| Ali, 2010 (32) | United Arab Emirates | Weight management behaviours and perceptions of women at increased risk of type 2 diabetes within UAE cultural context | Emirati national women, 18 years old or older, no previous diagnosis of diabetes (except gestational), with one or more of the following: gestational diabetes, abdominal obesity (weight circumference >88 cm) + family history of type 2 diabetes, or prediabetes (fasting plasma glucose or glucose load test) | 75 | 39 | 100 | NS | NS | NS |
| Allan, 1991 (33) | USA | Weight management in white women | Normal weight to moderate obesity (40–100% over ideal weight); born in US and living in study area; 18–55 years old; White | 37 | 33.7 | 100 | NS | 57% middle class, 43% working class; all but three is employed. 30% high school grad, 32% some college, 38% college grad | White |
| Barnes, 2007 (23) | USA | Weight loss maintenance as it relates to the theory of planned behaviour | African–American women, ≥ 18 , lost $\geq 10\%$ of body weight and either regained or maintained for a year | 37 | 41.6 | 100 | 32.75 | 84% employed; Highest level of education: High school 22% regainers (R), 0 maintainers (M); Some college 29% M; 48% R; College grad 50% M; 22% R; Grad school 21% M; 8% R | African–American |
| Before, 2008 (22) | USA | Perceptions and beliefs about body size, weight and weight loss among obese African–American women | ≥ 18 , African–American, female, obese according to self-reported weight and height. Excl. obvious intoxication or current inpatient for substance abuse treatment, | 62 | 46.6 | 100 | 40.3 | 15% some high school, 21% HS grad; 63% some college, 2% college grad; 50% full time employed; 8% | African–American |

(Continues)

Table 2 (Continued)

| Study ID | Country | Focus | Inclusion criteria | N | Mean age | % female | mean BMI | SES | Ethnicity |
|---------------------|---------|--|--|-----|----------|----------|----------|--|--|
| Bennett, 2013 (34) | UK | How men communicate with each other about their bodies, weight management projects and masculinities | marked inappropriate affect or behaviour, acute illness or impaired cognition NS | 116 | NS | 0 | NS | part time; 42% not employed | NS |
| Bidgood, 2005 (35) | UK | Obese adults' experiences and feelings about weight loss attempts and maintenance | Obese men and women ≥ 18 , BMI ≥ 30 | 18 | NS | 89 | NS | NS | NS |
| Byrne, 2003 (36) | UK | Psychological factors associated with successful and unsuccessful weight maintenance | Female, aged 20–60 years, history of BMI >29.9 who at some point in last 2 years lost $\geq 10\%$ weight through deliberate caloric restriction. Maintainers: maintained lower weight (within 3.2 kg) for ≥ 1 year. Regainers: Regained to within 3.2 kg of original weight. Excl. weight loss due to medical/ psychiatric condition or use of medication; weight loss or regain because of pregnancy or childbirth, history of anorexia or bulimia | 56 | 41 | 100 | NS | Social class 1–2 47%; 3 nm–3 m 30%, 4–5 1%; students 13%; housewives 7%; unemployed 1% | NS |
| Callen, 2008 (37) | USA | Weight change in older adults, focussing on methods | Community dwelling, ≥ 80 , 'cognitively intact or mild intellectual impairment', English speaking, BMI ≥ 27 , able to stand for height and weight | 9 | 82 | 33 | 30.17 | Education range 8th grade to postgrad. Two had incomes below poverty level | NS ('lack of ethnic representation') |
| Chambers, 2012 (38) | UK | Long term weight maintenance | 30 years or older, wide range of weight experiences. Excl factors that could impact directly on current weight (incl. pregnancy, some medications, medical conditions, and anorexia) | 14 | 48 | 75 | NS | NS | Caucasian |
| Chang, 2008 (39) | USA | Motivators and barriers to healthful eating and physical activity among low-income overweight/obese non-Hispanic black and white mothers | Women, non-Hispanic white or non-Hispanic Black, 18–35 years old, not pregnant or breastfeeding, able to speak and read English, BMI 25–39.9, interested in prevention of weight gain, ≥ 3 months postpartum, ≥ 1 child enrolled in government food and nutrition service programme | 80 | 25.8 | 100 | 31.15 | 47% high school or less education | 41 non-Hispanic black; 39 non-Hispanic white |
| Collins, 2012 (25) | USA | Perceptions of previously obese individuals after self-guided weight loss | Female, aged 35–60, self-identified as 'obese-reduced weight maintainers' of $\geq 10\%$ of original weight for ≥ 1 year | 11 | 45.6 | 100 | NS | NS | NS |

(Continues)

Table 2 (Continued)

| Study ID | Country | Focus | Inclusion criteria | N | Mean age | % female | mean BMI | SES | Ethnicity |
|--------------------|-----------|---|---|----|----------|----------|----------|--|--|
| Davis, 2014 (26) | USA | Experiences of college students in the weight-loss process | Full time students at one Midwestern university considered overweight at some point during college enrolment, active in trying to lose weight for ≥ 6 months, willing to be interviewed, 18 years or older | 5 | NS | 60 | NS | NS | Four Caucasian; one 'person of colour' |
| Diaz, 2007 (24) | USA | Weight loss experiences, attitudes and barriers in overweight Latino adults | Age ≥ 20 , BMI ≥ 25 , self-identified Latino | 21 | NS | 90 | NS | Five had education beyond high school | Self-identified Latinos |
| Faw, 2014 (40) | USA | Support management strategies used by overweight young adults attempting to lose weight | Perceive themselves as being overweight or obese, attempted to lose weight at least once during past year (all undergraduate university students) | 25 | 21.1 | 64 | 27.1 | NS | Asian/ Asian American 44%; white 40% |
| Frank, 2012 (27) | USA | Weight loss maintenance | History of weight cycling; highest ever BMI ≥ 30 ; maintained loss reflects BMI of 18.5–24.9; weight loss achieved without bariatric surgery and maintained for ≥ 3 years; American born and raised | 10 | NS | 90 | NS | Two some college; Three completed college; Five college + advanced degree | Eight Caucasian, one Latina and one biracial |
| Green, 2009 (41) | UK | Phenomenology of repeated diet failure | Over 18, speak fluent English, ≥ 2 serious attempts to diet which they considered had failed, unhappy with current eating habits. Excl eating disorder or medical/ psychological input re: eating | 11 | 40 | 82 | NS | NS | One British Pakistani; 10 white British |
| Heading, 2008 (42) | Australia | Risk logics, embodiment, issues related to adult obesity in remote New South Wales | 'rural adults', 'history of unwanted weight' | 19 | NS | 68 | NS | Education ranged from some high school to postgraduate qualifications | NS |
| Hindle, 2011 (43) | UK | Experiences, perceptions and feelings of weight loss maintainers | Maintained $\geq 10\%$ weight loss for ≥ 1 year, stable weight for last 6 months, 18 years or older and English speaking. Excl. weight loss through bariatric surgery, VLCD, within 6m of giving birth | 10 | 44 | 100 | 25.8 | 'Employed, retired or housewives with employed partners' | Caucasian |
| Hwang, 2010 (44) | USA | Social support for weight loss in web community | Members of SparkPeople.com online weight loss community | 13 | 36 | 100 | NS | NS | White |
| Jaksa, 2011 (28) | USA | Experience of maintaining substantial weight loss | Maintained weight loss for ≥ 2 years; lost $\geq 20\%$ body weight; within 10–15 lb of their goal weight; willing to commit to reflecting on their experience through the | 12 | NS | 92 | NS | Four graduate students; five full time employed; one part time employed; one | NS |

(Continues)

Table 2 (Continued)

| Study ID | Country | Focus | Inclusion criteria | N | Mean age | % female | mean BMI | SES | Ethnicity |
|------------------------|----------------|---|---|----|----------|----------|----------|---|--|
| Karfopoulou, 2013 (45) | Greece | Weight loss maintenance and Mediterranean diets | process of an audiorecorded interview; not undergone any surgical procedures affecting or manipulating appetite regulation; at least 20 years old 20–65 years old, at some point in their lives BMI >25 (excl. pregnancy), intentionally lost ≥10% of starting weight. Maintainers had to be at or below the 10% weight loss for ≥1 year, regainers had to be at a weight ≥95% of their starting weight. Excl. history of anorexia | 44 | 33 | 59 | 27.65 | NS | stay at home mother; one on long term disability NS |
| Macchi, 2007 (29) | USA | Process of meaning-making associated with weight loss and maintenance | Female, 30–45 when initially lost weight, intentionally lost ≥10% of initial body weight without undergoing bariatric surgery and maintained ≥10% lost | 10 | NS | 100 | NS | NS | All white |
| McKee, 2013 (46) | UK | Weight maintenance | Previous BMI ≥25, intentionally lost 10% through diet and/or exercise and maintained for ≥12 months within range of 2.2 kg OR regained weight lost | 18 | 45 | 89 | 28.3 | Non-academic university staff, self-employed or retired members of the public | 10 British, 5 South Asian, 3 other |
| Reyes, 2012 (47) | USA | Weight loss maintenance | 25–64 years old, intentionally lost ≥10% weight in past 2 years; regainers regained ≥33% of their weight loss and maintainers regained ≤15%. Excl participants with type 2 diabetes, history of cancer, or bariatric surgery | 29 | 47 | 65.6 | 32.5 | NS | 41% white; 59% African-American |
| Sanford, 2012 (48) | US, UK, Canada | Weight loss blogs | Need to lose ≥100 lb (not clear how this was defined), had been blogging for ≥3 months about weight loss. Excl bariatric or lap band surgery | 50 | 40 | 80 | NS | NS | NS |
| Stuckey, 2011 (49) | USA | Successful weight loss maintenance practices | lost ≥30 lb and maintained for ≥1 year, age >21, not pregnant, English speaking. Excl. bariatric surgery | 61 | NS | 72 | NS | 90% at least some college | 79% white |
| Su, 2015 (50) | Taiwan | Taiwanese perimenopausal women's weight loss experience | Women 45–60 years, undergoing perimenopause (self-report); BMI ≥27; trying to lose weight; could communicate in Mandarin and Taiwanese; met diagnostic criteria for metabolic syndrome for Asian populations (e.g. >3 of (1) waist circumference ≥80 cm, (2) fasting blood | 18 | 52 | 100 | 32.6 | 5 housewives, 13 employed. 7 had attended university. | NS |

(Continues)

Table 2 (Continued)

| Study ID | Country | Focus | Inclusion criteria | N | Mean age | % female | mean BMI | SES | Ethnicity |
|-------------------|-----------|---|--|----|----------|----------|----------|--|--|
| Thomas, 2008 (51) | Australia | Lived experiences of obesity and weight loss attempts | glucose ≥ 100 mg dl ⁻¹ , (3) high-density cholesterol <50 mg dl ⁻¹ , (4) triglycerides ≥ 150 mg dl ⁻¹ (5) systolic pressure ≥ 130 mmHg or diastolic ≥ 85 mmHg) BMI ≥ 30 | 76 | 47 | 83 | 42.5 | 51% unemployed. 45% at least completed high school | 80% White Australian; 5% English; 20% Other European |
| Tyler, 1997 (52) | USA | Weight loss methods among women | Female, 18–60 years without major health problems, not pregnant, US born, living in study area, normal or overweight BMI | 80 | 34 | 100 | NS | 50% higher SES (Hollingshead index 40-66); 50% lower SES (8-39). 26 high school or less; 28 partial college; 13 college graduate; 12 graduate degree | 40 African-American and 40 Euro American |
| Witwer, 2014 (30) | USA | Weight loss maintenance | Adult (18 years or older), lost $\geq 10\%$ of body weight and maintained loss for ≥ 1 year, excl. bariatric surgery, unintentional weight loss, residents of long-term care settings, non-English speakers | 12 | NS | 66 | NS | 3 some college, 9 college degree; 9 full time employed, 2 part time, 1 retired | NS |

Note: NS=not specified; Excl=excluded; SES: socio economic status

phenomenological analysis, six used thematic analysis and eight reported using grounded theory. The remainder did not report their approach.

Twelve of the studies did not report their sampling methods; of those that did, the most common methods (in order of frequency) were purposive sampling (nine studies), convenience sampling (four studies), theoretical sampling (three studies), and snowball, random, and maximum variation sampling (one study each). Where reported, recruitment was primarily through advertisements in local media, flyers in public places (some targeting gyms and locations where weight loss programmes were offered), and by word of mouth and through personal contacts. Two studies posted flyers in medical centres, and one recruited via referrals from a health and wellness centre.

Participants

Combined, the included studies represent 1,050 participants. The majority of studies (17) took place in the

USA. Ten studies focussed exclusively on weight loss, and eleven focussed exclusively on weight loss maintenance. Of the latter, five explicitly recruited 'regainers' and 'maintainers', and focussed on differences between the two. Seven focussed exclusively on experiences within particular population groups, e.g. by ethnicity or age range.

Across the 21 studies that reported it, the average age of participants was 42. Studies predominantly contained more women than men. Where reported (11 studies), average BMI across the studies was 31.9 kg m⁻², ranging from 25.8 (study of successful, previously obese weight loss maintainers) to 42.5 kg m⁻². Of the 18 studies that reported data on ethnicity, 11 represented all or majority white populations. Two included only African-American participants (22,23), and one included only Latinos (24). Approximately half of the studies reported data relevant to socioeconomic status; of these, the majority reported including predominantly well-educated and middle to high socioeconomic status participants.

Quality of included studies

Quality of included studies was mixed, in part reflecting that a proportion of the included studies had not been published in peer reviewed journals (unpublished doctoral theses) (25–30). A summary of answers for each CASP domain is presented in Table 3. Issues were predominantly related to recruitment methods, the relationship between the researcher and participants, and provision of sufficient detail on the method of analysis.

Cognitive and behavioural strategies

Strategies employed in weight loss attempts

The most commonly discussed groups of strategies were restrictions, scheduling of diet and activity, self-monitoring, professional support and use of weight management aids (Fig. 1). Generally, and in part reflecting the varied interests of the studies, there was little information on attitudes and beliefs regarding implementation of these strategies. Where attitudes and beliefs around specific strategies were discussed, these are reported in the succeeding texts. A separate section ('Implementation of strategies') discusses findings relating to participant choice and use of strategies more broadly.

For each of the most commonly discussed groups of strategies, content predominantly related directly to dietary change. For restrictions, this included avoiding certain foods, particularly high fat, high calorie and high sugar items. Participants spoke of cutting out specific foods, rather than groups of foods (e.g. gravy (33) and wine (38)). They also mentioned meal skipping and portion control methods, and spoke of avoiding certain settings as a way to restrict access to food, including restaurants and family gatherings. (28,30,40) Negative attitudes were expressed in relation to restrictions, with participants expressing feelings of deprivation. These feelings were presented as challenges to maintaining use of these strategies, as feelings of deprivation could lead to participants 'falling off the wagon'. (27,43,46,47) In regard to scheduling, the most commonly occurring strategies related to scheduling meals (e.g. three meals a day with no snacking outside of meal times)

(30,33,45,49) and the practice of not eating late at night or only eating specific foods after a certain time in the evening. (50,52) Studies also reported participants' efforts to schedule physical activity at a time that fit with their lifestyles and preferences, including exercising at times where fewer people were present to avoid embarrassment (35). One study conducted exclusively with African-American women reported on the importance of scheduling time for hairstyle maintenance after exercise (23). Generally, strategies in this domain were discussed in a positive manner, with scheduling viewed as a way in which to establish a sustainable routine (25,26). For example, one participant explained, 'You just gotta get into that schedule. And its automatic and it just really makes it easier when I do have a routine. If I don't have a routine, God knows I don't have an idea what things would look like, because it would just be so sporadic.' (25)

Self-monitoring strategies most commonly focussed on self-weighing and monitoring food intake, specifically calories. Participants also spoke of monitoring fitness, either in terms of time, distance, steps or calories burnt. In addition to weighing themselves, participants discussed other ways of monitoring their weight, including visual inspection in a mirror (33,34,36,45), the fit of clothing (23,33,38,42) and physical capabilities (e.g. climbing stairs and reaching one's toes) (25,38,47). Attitudes and beliefs surrounding self-monitoring were mixed and often strongly expressed. Negative aspects included difficulties with maintaining vigilance over the long term and feelings of shame related to food consumption and weight (25,35,8). In two studies, participants cited fear as a barrier to continued self-weighing. (36,47) In contrast, more positive takes on self-monitoring included assertions that it led to increased feelings of self-efficacy and self-control, as well as increased accountability for one's own actions (28,43,46,48); in one study, a participant went so far as to call the weighing scale his 'best friend'. (47)

Finally, use of professional support and weight management aids occurred in many participant narratives, again accompanied by mixed attitudes and beliefs. Studies often included participants who had formerly attended weight loss programmes, and those who had solicited help from personal

Table 3 Summary of quality judgements

| Critical Appraisal Skills Program question | Number of answers across all included studies | | |
|--|---|---------|----|
| | Yes | Unclear | No |
| Was there a clear statement of the aims of the research? | 29 | 0 | 2 |
| Is a qualitative methodology appropriate? | 30 | 1 | 0 |
| Was the research design appropriate to address the aims of the research? | 26 | 3 | 2 |
| Was the recruitment strategy appropriate to the aims of the research? | 13 | 10 | 8 |
| Was the data collected in a way that addressed the research issue? | 25 | 5 | 1 |
| Has the relationship between researcher and participants been adequately considered? | 5 | 18 | 8 |
| Have ethical issues been taken into consideration? | 15 | 14 | 2 |
| Was the data analysis sufficiently rigorous? | 12 | 10 | 9 |
| Is there a clear statement of findings? | 16 | 10 | 5 |
| Is the research valuable? | 24 | 6 | 1 |

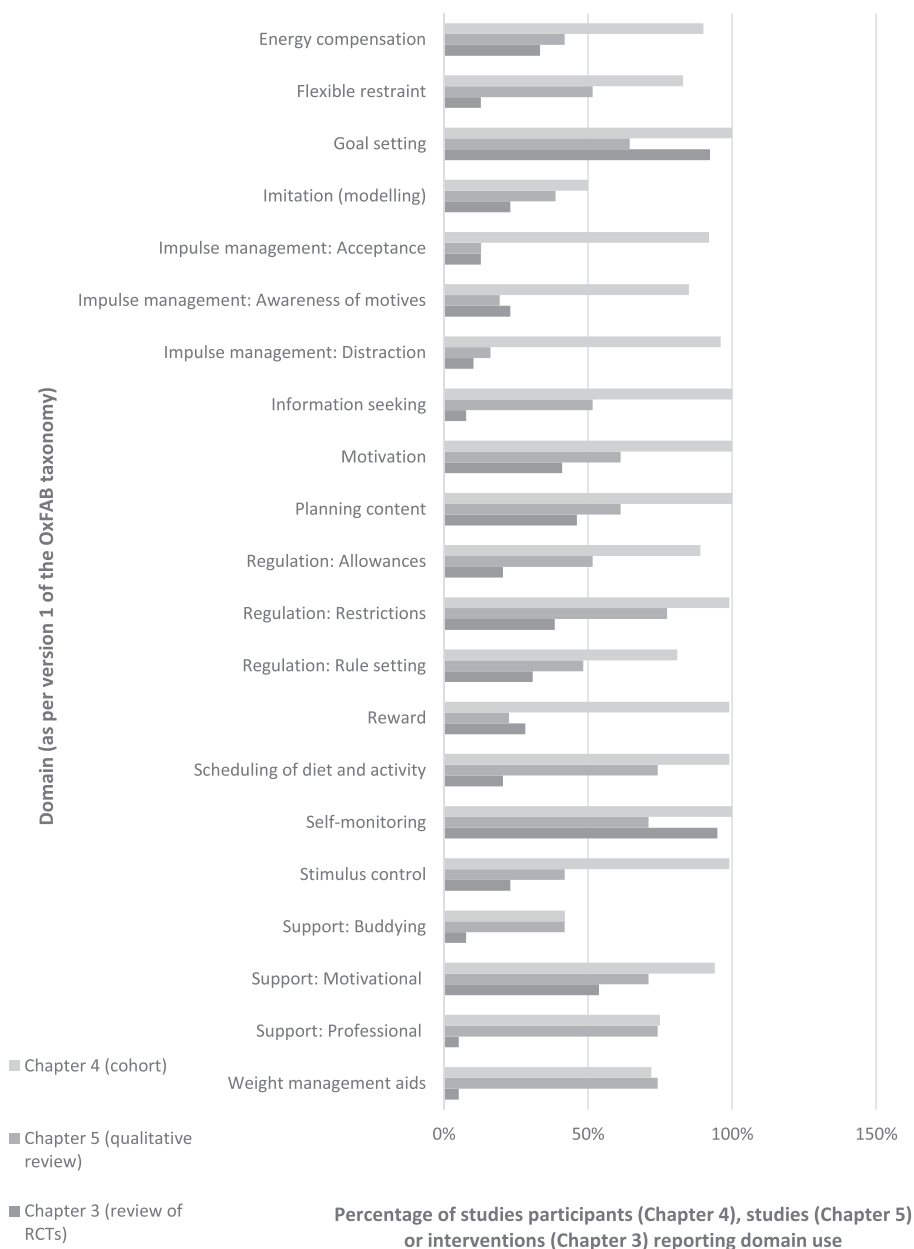


Figure 1 Frequency of domain coding across included studies (using OxFAB taxonomy), compared with domain coding from separate review of self-help interventions (9). *Note:* * new domain introduced through process of this review. As such, these domains are new to this review and hence were not used to code self-help interventions.

trainers, doctors and nutritionists. Negative experiences included advice that did not fit with participants’ daily routines (31,32), experiences of relapse once programmes ended (25,46) and the financial costs of accessing such support (26,47,51). Positives included motivational support and accountability (26,43) and access to trusted information (24,26). The latter particularly pertained to personal trainers who helped with exercise regimes. The weight management aids discussed included medications, over-the-counter supplements, exercise equipment and exercise videos. In a study of Emirati women, participants spoke positively of these aids

as a way to overcome cultural barriers to weight loss, which included cultural norms surrounding physical activity outside of the home and dietary constraints involving cooking for guests (32). Other studies noted negative views towards weight loss medications specifically, with participants referring to them as ‘unnatural’ (22,25) and expressing concerns about side effects and weight regain once medication was discontinued (51). In one study, participants referred to weight loss medications as ‘band-aids’, implying that they were a temporary fix to a problem requiring greater intervention (25).

Mapping and expansion of OxFAB taxonomy

All OxFAB domains were covered in multiple publications, ranging from three (impulse management domains) to 24 times (regulation: restrictions) (Fig. 1). Strategies not covered in the first version of the OxFAB taxonomy also emerged. This led to the introduction of two new domains, namely reframing and self-experimentation. Self-experimentation, a recognized technique in behaviour change interventions, refers to the process of experimenting with different techniques and behaviours, assessing their outcomes and deciding whether or not to continue based on the observed outcome (53). Studies described this as the mechanism by which participants chose a 'primary strategy' to use in a weight loss attempt (25,33), using 'self-analysis' to create eating and exercise plans (29,52). No studies discussed participants' attitudes or beliefs about use of this strategy.

Reframing refers to the process of redefining the behaviours and process of weight loss, shifting from 'diet' terminology to thinking about weight loss behaviours as 'a way of life.' (26,27,29,30,45) This included participant statements such as: 'It's not a diet ... I try hardly ever to say that word. ... Because it's gotta be lifestyle' (27); 'I went with the belief that this wasn't a diet, but what I'd got to do was change my way of eating' (42); and, 'you've got to tell yourself you're not on a diet you're just changing your way of life.' (46) In other studies, participants used specific metaphors as a way of reframing, re-envisaging food as 'fuel', 'drugs' or 'poison' (28), and hunger pangs as 'Pac Men [video game animations] eating away... at fat' (49). Participants who described using reframing strategies spoke of their positive role in increasing long-term commitment to their weight management practices and boosting their self-esteem (27,42,43,45). However, not all discussions of reframing were positive: one participant found it 'hard' to reframe food as a 'vice', as she'd previously thought of it as a 'comfort item' that was now no longer available to her (29).

In addition to the previously mentioned new domains, impulse management domains were expanded to include delay (responding to an unwanted impulse by delaying the desired action (28,50,52)) and substitution (using a physical substitution for eating, e.g. chewing on a toothpick (24,28,30,45,49,52)). Finally, a new weight management aid was also identified, namely a girdle, highlighting the existence of some weight control practices that are culture-specific. In this study of Latino adults, the authors explain that, although discouraged in the US, using a girdle postpartum is considered an effective weight management technique in Mexico (24).

Implementation of strategies

In addition to covering specific strategies, there was also some reflection on the ways in which participants selected and implemented the strategies they would use, although generally this was limited and related more to the selection

of strategies as they related to one another or stages in weight loss attempts, rather than to ways in which attitudes and beliefs influenced these choices. In a study exploring differences between people who regained weight lost versus those who maintained their initial weight loss, the authors state that maintainers spoke of having a number of strategies they could employ when seeking to manage their weight, and contrasted this with regainers who usually attempted to lose weight 'via a single strategy of reducing their calorie intake'. (38) A second study found that although participants experimented with a number of different strategies for weight loss, they usually had a preferred method that they repeatedly turned to. The most common 'primary weight loss methods' identified by the authors were reducing high calorie foods, increasing the intake of low calorie food and exercising on one's own (52).

Other studies reflected how strategy choices related to one another and changed over time. Faw (2014) focussed exclusively on methods relating to social support and found clusters of strategies, with some participants favouring direct approaches (e.g. directly soliciting support, confronting those who did not offer it) and others using a variety of indirect methods (e.g. complaining as a way to elicit support, avoiding people who did not offer support). The author labels this the 'direct/indirect strategy continuum' (40). Collins (2012) found that the strategies selected by participants were 'unique' depending on the participant and changed over time through the process of self-experimentation (25). Allan (1991) divided the weight management process into stages (appraising, de-emphasising, mobilising, enacting and maintaining) and noted that each stage consisted of multiple processes that were characterised by the use of specific tactics or strategies. The complexity of these strategies and tactics increased with each stage of the process (33). Finally, Thomas (2008) noted a similar pattern of progression through strategy type in their participants (obese adults who had attempted to lose weight): participants began by looking up and following diets they found in magazines as teenagers, then moved on to behavioural weight management programmes, and then turned to medications and diet supplements (51).

Differences in strategy use over time can also be observed through comparing those studies conducted exclusively in people attempting to achieve initial weight loss versus those conducted exclusively in people attempting to maintain weight loss. Generally, a wider range of strategies were discussed in relation to weight loss maintenance than in relation to acute weight loss attempts. In particular, weight loss maintenance narratives included more discussion of flexible restraint, goal setting, impulse management: awareness of motives, motivation, planning content, rule setting, self-monitoring and stimulus control. In contrast, those studies focussing on weight loss included discussion of imitation (modelling) strategies, which did not arise in studies focussing exclusively on weight loss maintenance.

Discussion

The most commonly discussed strategies involved restrictions, self-monitoring, scheduling, professional support and weight management aids. With the exception of scheduling, for which participant experiences were predominantly positive, participants' attitudes and beliefs surrounding implementation of these strategies were mixed. Studies suggested that choice and use of these strategies changed throughout different stages of weight loss attempts, with a wider range of strategies discussed in relation to weight loss maintenance than to weight loss itself. The process of inductive coding in this review led to the expansion of the OxFAB taxonomy, with two new domains added, namely reframing and self-experimentation.

To our knowledge, this is the first systematic review of qualitative studies to examine self-directed weight loss efforts. Other qualitative reviews of weight loss in overweight and obese adults have included studies focussing on participant experiences of particular weight loss programmes (54–57). Although these can be used to inform intervention development, the majority of adults currently trying to lose weight are doing so without the help of a formal programme, and therefore it is crucial we increase our understanding of this area. It is unsurprising that dietary restrictions and self-monitoring were frequently the focus of the studies included in this review. Many weight loss interventions include these components (3,9) and observational studies have linked them with improved weight loss and maintenance trajectories (58–60). In contrast, the other commonly mentioned strategies emerging from this review are less evident in interventions: in a recent systematic review of self-help interventions for weight loss, only six of the 39 interventions recommended scheduling of diet and physical activity, and only two recommended weight management aids (Fig. 1) (9). These results suggest that the strategies people are using in self-directed weight loss attempts do not always mirror those being suggested in self-help interventions. Further research into these potential disconnects is needed, especially given that results from the qualitative studies in this review are in line with a recent observational cohort study in adults trying to lose weight, which found the majority were employing scheduling techniques and weight management aids as part of their weight loss attempts (10).

A major limitation of this review is the scope and quality of the included studies. Although some were high quality, quality assessment raised issues for many of the studies, and a number of the included studies were unpublished theses. This affects our confidence in the overall validity and consistency of our findings, although the full transcripts, which were available alongside many of the unpublished theses, go some way to alleviate these concerns. The majority of studies were undertaken in the US, and the vast

majority were undertaken in the developed world among participants of higher socioeconomic status. Given cultural variation in strategies used and barriers to self-directed weight loss that represent an unequal burden on people of lower socioeconomic groups, further studies in more diverse populations are needed (61,62). In addition, few of the included studies focussed explicitly on weight loss strategies, and therefore, little detail was available on attitudes and beliefs surrounding these strategies. Given the nature of the available data, it is difficult to determine if the content of the studies accurately reflect the experiences of the participants, or if the studies' results have been tailored based on the interests of the researchers. Despite this, the studies still yielded rich data on weight loss strategies, pointing to the prominence of techniques and methods in participants' accounts of their weight loss experiences.

The limitations with study quality described in the preceding texts point to five specific recommendations relating to the methods and reporting of future qualitative studies in this area, which are informed by the CASP tool used to assess the studies in this review. (15) Firstly, many of the quality assessment domains were judged to be 'unclear' simply because of a lack of sufficient detail with which to make a judgement. In some part, this may be due to constraints on word length in published articles; where this is the case, authors should be encouraged to make study protocols available either through online registries or as supplemental material accompanying journal articles. Publishing study protocols would also allow readers to more effectively judge the extent to which individual study findings were guided by researcher expectations and biases. The second issue relates to recruitment methods, and ensuring the method is appropriate to meet the aims of the research. For example, in this review some studies aimed to capture experiences from a diverse range of people but ended up drawing on a very homogenous group. Often, snowball sampling was employed; where a study aims to capture a diverse sample, other methods for recruitment may be required. Thirdly, the relationship between the researcher and participants must be considered – as explained in the CASP tool, this includes the researcher critically examining their own role in terms of potential bias and influence during formulation of research questions and data collection. Fifthly, in terms of the data analysis process, it should be clear how categories and themes were derived when using thematic analysis, how the data presented were selected from the original sample and to what extent contradictory data were taken into account. Sufficient data should be presented to support the conclusions of the authors.

Although implications for future research are relatively clear, implications for practice are less so. Currently, empirical evidence is limited in its ability to identify effective cognitive and behavioural strategies for self-directed weight loss attempts. Research is underway to further explore this

area, but in the meantime, this lack of empirical evidence means we are unable to say based on the results of this review if the disconnect between the strategies used by individuals in self-directed weight loss attempts and those prescribed by self-help interventions reflect the fact that individuals are using less effective strategies, or reflect omissions in the self-help interventions currently being tested. What is clear from this review is that a wide range of strategies are employed in self-directed weight management, with patterns of use appearing to change over time, and attitudes towards strategy implementation varying based on individual circumstances. This suggests there may not be a 'one-size-fits-all' approach to cognitive and behavioural strategies in self-directed weight loss attempts.

In summary, this review points to a number of future directions. Further high-quality primary studies are needed to explore experiences of self-directed weight loss in overweight and obese adults, with a particular focus on choosing and implementing cognitive and behavioural techniques and on recruiting more diverse samples. This review will be used to inform revisions to the OxFAB taxonomy, in particular highlighting the phenomenon of 'reframing', not currently prevalent in behaviour change literature or included in existing behaviour change taxonomies (8,53). Finally, it is intended that this review will act as a database that will be regularly updated, allowing for domain specific papers to be developed that will enable richer and more detailed analysis to be undertaken than was possible in this overview paper. A fuller understanding of the cognitive and behavioural strategies used in self-directed weight loss efforts has the potential to enrich the advice provided to individuals trying to lose weight on their own; at present, this review suggests that interventions targeting these individuals do not necessarily reflect the lived experience of self-directed weight loss.

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Conflict of interest statement

No conflict of interest was declared.

Supporting information

Additional Supporting Information may be found in the online version of this article, <http://dx.doi.org/10.1111/obr.12500>

Figure S1 PRISMA diagram of study flow.

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