

Bond University
Research Repository



Participant experiences of two successful habit-based weight-loss interventions in Australia: a qualitative study

Cleo, Gina; Hersch, Jolyn; Thomas, Rae

Published in:
BMJ Open

DOI:
[10.1136/bmjopen-2017-020146](https://doi.org/10.1136/bmjopen-2017-020146)

Published: 31/05/2018

Document Version:
Publisher's PDF, also known as Version of record

[Link to publication in Bond University research repository.](#)

Recommended citation(APA):

Cleo, G., Hersch, J., & Thomas, R. (2018). Participant experiences of two successful habit-based weight-loss interventions in Australia: a qualitative study. *BMJ Open*, *8*(5), [e020146]. <https://doi.org/10.1136/bmjopen-2017-020146>

General rights

Copyright and moral rights for the publications made accessible in the public portal are retained by the authors and/or other copyright owners and it is a condition of accessing publications that users recognise and abide by the legal requirements associated with these rights.

For more information, or if you believe that this document breaches copyright, please contact the Bond University research repository coordinator.

BMJ Open Participant experiences of two successful habit-based weight-loss interventions in Australia: a qualitative study

Gina Cleo,¹ Jolyn Hersch,² Rae Thomas¹

To cite: Cleo G, Hersch J, Thomas R. Participant experiences of two successful habit-based weight-loss interventions in Australia: a qualitative study. *BMJ Open* 2018;**8**:e020146. doi:10.1136/bmjopen-2017-020146

► Prepublication history and additional material for this paper are available online. To view these files, please visit the journal online (<http://dx.doi.org/10.1136/bmjopen-2017-020146>).

Received 17 October 2017
Revised 16 March 2018
Accepted 3 May 2018



¹Centre for Research in Evidence-Based Practice (CREBP), Bond University, Gold Coast, Queensland, Australia
²School of Public Health, The University of Sydney, Sydney, New South Wales, Australia

Correspondence to
Dr Gina Cleo;
gcleo@bond.edu.au

ABSTRACT

Objectives Habit-based weight-loss interventions have shown clinically important weight loss and weight-loss maintenance. Understanding why habit-based interventions work is therefore of great value, but there is little qualitative evidence about the experiences of participants in such programmes. We explored the perspectives of individuals who completed two habit-based weight-management programmes, Ten Top Tips and Do Something Different.

Design One-on-one, face-to-face, semistructured interviews were conducted and analysed thematically.

Setting Participants from the community were interviewed at Bond University, Australia.

Participants Using a maximum variation design, we recruited 15 participants (eight men, seven women) aged 39–69 years (mean 53.3 years, SD 10.3) with a range of education levels (no high school to university degree) and percentage weight change on the programmes (+4.0% to –10.4%).

Main outcome measures (1) The general experience of participants who completed the Ten Top Tips or Do Something Different intervention, (2) whether and how the interventions affected the participants' lifestyle postintervention, and (3) participants' views regarding the acceptability and practical application of Ten Top Tips and Do Something Different.

Results Participants reported positive experiences of the two programmes, both during and after the interventions. Participants particularly enjoyed the novelty of the interventions as they shifted focus from diet and exercise, to practical everyday habit changes. They also reported indirect health benefits such as increased energy levels, increased confidence and improved self-awareness. Accountability throughout the programmes and convenience of the interventions were identified as key themes and facilitators for weight-loss success.

Conclusions This study offers insight into how and why habit-based interventions might work. Overall, Ten Top Tips and Do Something Different are practical and convenient to implement, and are viewed favourably by participants when compared with conventional lifestyle programmes for weight control.

Trial registration number ACTRN12615000114549.

Strengths and limitations of this study

- This study offers insight into how and why habit-based interventions work.
- This study used purposeful maximum variation sampling to select the participants which potentially allowed for heterogeneous responses.
- Our qualitative data supported the quantitative findings of our randomised controlled trial. For example, the participants' comments on sustained behaviour change aligns with their continued weight loss at follow-up.
- It is possible that participants have felt grateful to the facilitating researcher and therefore, may have wanted to say positive things about the programmes. However, this was potentially addressed by explicitly asking for burdens of intervention implementation.

INTRODUCTION

The global prevalence of obesity has risen dramatically over the past three decades with more than a third of adults currently classified as overweight or obese.¹ Many weight-management interventions are successful in helping individuals lose weight, however maintaining weight loss is rare.² As time passes after weight loss, individuals start disengaging from weight-management programmes, re-engaging in old habits and impairing any progress they have made while following the recommendations.³

Habits are automatic behavioural responses to environmental cues. When a new behaviour is performed, a mental association between the context and the behaviour is created.⁴ As behaviour is repeated in the same context, regulation of the behaviour gradually shifts from being internally guided (eg, beliefs, attitudes, intentions) to being triggered by situational or contextual cues (eg, time of day, place, emotion), making alternative behaviours less accessible.⁵ Habits, therefore, almost always override intention.^{6,7}

Habit-change is an important goal for behaviour-change interventions as habitual behaviours are elicited automatically, with minimal prior deliberation and are therefore, likely to be maintained.⁸ Furthermore, breaking habits increases an individual's mindful actions as they engage in conscious and purposeful thought.⁹ Mindfulness is suggested to draw attention to the behaviour, making it easier to recognise compliance with health-related goals and disengage from inimical habits.⁴

Despite the promising outcomes of habit-based weight-loss interventions, it is a new and evolving area of investigation, and therefore, little research is currently available, especially qualitative work. Understanding and evaluating the influences of change and the general experiences of participants on habit-based weight-loss interventions is important to help inform future interventions in this novel and emerging field.

Recently, we conducted a randomised controlled trial (RCT) of two habit-based weight-loss interventions which focused on habit change via different mechanisms.¹⁰ Ten Top Tips (TTT)¹¹ is based on habit-formation through context-specific repetition, whereas Do Something Different (DSD)¹² focuses on breaking old, unhealthy habits through enhancing mindfulness. Our trial explored the quantitative weight-loss effects of these two interventions: TTT and DSD, compared against a waitlist control (WL). These data showed significant weight-loss results (adjusted mean difference postintervention: TTT: -2.9 kg, $p \leq 0.001$; DSD: -2.3 kg, $p \leq 0.001$) with promising long-term (12 months) weight-loss maintenance for both interventions (total mean change: TTT -5.7 kg [95% CI -0.8 to -3.3]; DSD -4.6 kg [95% CI -6.6 to -2.6]).^{10 13} The objectives of the present qualitative study were to (1) explore the general experience of participants who had completed the TTT or DSD intervention, (2) discover whether and how the interventions affected the participants' lifestyle postintervention and (3) consider the participants' views regarding the acceptability and practical application of TTT and DSD.

METHODS

The research team

Using the COnsolidated criteria for REporting Qualitative research checklist for reporting qualitative research,¹⁴ we report the research team has expertise across: dietetics (GC), psychology (RT, JH) and qualitative research (JH, RT) and (GC, RT) have previously published on habit-change interventions.¹³ The primary researcher (GC) is an accredited practising dietitian and engaged in full-time research in the area of habit-change for weight-loss maintenance (online supplementary table 1).

Participants

Participants for this qualitative study were recruited via invitation from an RCT of habit-based weight-management interventions.¹⁰ Participants were recruited via local televised news and radio interviews and were eligible for

the trial if they were overweight or obese as per body mass index classification $\geq 25 \text{ kg/m}^2$, were aged 18–75 years and had no clinical contraindications to participate in the study. They were randomly assigned to either TTT (n=25) or DSD (n=25) interventions, or to a WL (n=25); control group participants were not recruited for this qualitative study. Interventions were conducted for 12 weeks, after which postassessment measures were undertaken. Participants were followed up 6 and 12 months postintervention to collect anthropometric and psychometric outcome data.

Interventions

Detailed descriptions of TTT and DSD are reported elsewhere.¹⁰ In brief, TTT is based on habit-formation theory. Written materials guided participants through a set of weight-management behaviours to be performed routinely with an intent to make those behaviours habitual. For example, participants were recommended to keep to a meal routine, eat from a smaller plate, eat mindfully and pack a healthy snack¹¹ (www.weightconcern.org.uk/tentoptips). A key component of TTT is repeating the behaviour in a consistent context (eg, time or place). A logbook ('tick-sheet') was provided to participants for daily self-monitoring.¹⁵

In contrast, DSD focuses on increasing the participants' behavioural flexibility by breaking daily habits. The aim of DSD is to break the distal habits proposed to play a role in unhealthy dietary and exercise behaviours.^{16 17} DSD required participants to engage in novel activities to expand their behavioural repertoire. Interestingly, these activities often did not relate to food or exercise. For example, tasks included: 'listen to a different genre of music today', 'call a long lost friend or relative' and 'spend 15 min writing a short story' (www.dsd.me).⁹ The tasks were sent via text message and/or email 3–4 days per week and a programme-specific online platform was used for self-monitoring adherence.

To promote accountability and help reduce attrition, participants in both TTT and DSD interventions received a weekly phone call from GC. Phone calls commenced with an open-ended question, '*How have you managed on the programme this week?*' which was designed to open up discussion regarding the barriers and facilitators of programme adherence. Problem-solving strategies were discussed as necessary. Participants were encouraged to record a food diary for self-monitoring purposes.

Qualitative interview study

We conducted purposeful maximum variation sampling¹⁸ to recruit participants from both active intervention groups. We recruited from multiple age groups, education levels, a range of percentage weight change on the programmes (loss and gain) and different genders. These demographic categories were selected based on recent research showing age, education level and weight-loss success, can effect an individual's perceived barriers perceptions of weight-loss programmes.¹⁹ An invitation

was sent via email to potential participants based on their demographic and 12-week postintervention weight-change data. The email included the aim of the interview and the nature of the questions to be asked. Participants then replied with an acceptance or decline to participate in the qualitative study. The interviews were conducted 6 months after the interventions concluded, during the participant's scheduled follow-up appointment with GC. There had been no contact between participants and researchers during this time.

Interview schedule and procedure

The interview schedule was iteratively developed, using the study objectives, by GC, RT and an independent external qualitative methodologist with expertise in weight-management research (DR). The interview questions were piloted within the team, and refined accordingly, prior to participant recruitment. The full interview schedule is included in the supplementary material (online supplementary table 2).

Participation in the interviews was entirely voluntary and written informed consent was obtained prior to the interviews. Additionally, participants provided verbal consent prior to the commencement of the interviews. Semistructured, one-on-one, face-to-face interviews were conducted with each participant by the principal researcher (GC) and lasted 35–60 min. Interviews were audio-recorded, transcribed verbatim, checked, anonymised and corrected against the audio file by GC. The participants were encouraged to engage in indepth discussions during the interview. No field notes were taken during the interview so as to not distract the interviewee as well as to maintain an easy flow of conversation and casual atmosphere to the session. A \$20 gift card was given to participants as an honorarium for their participation in the interview.

Data capture, coding and analysis

This study examined the experiential knowledge of participants. Drawing from the theoretical framework, we used a phenomenology approach to understand the 'constructs, concepts or ideas people use in everyday life to make sense of their world'.²⁰ The method of thematic analysis was based on an inductive approach which directly drew codes, categories or themes from the data.²¹ Responses from participants in TTT and DSD were analysed separately. Similarities in responses were thematically grouped across interventions and differences highlighted in the Results and Discussion sections.

Interview audio-recordings were transcribed in encrypted Microsoft Word documents, and qualitative data were extracted to Microsoft Excel. First, GC read the data carefully to identify meaningful units of text relevant to the study objectives. Second, units of text dealing with the same content were grouped together in analytical categories and given provisional definitions. The same content of text could be included in more than one category. Third, the data were systematically reviewed

to ensure that a name, definition and exhaustive set of data to support each category were identified. The coherence and replicability of the themes were verified by an independent researcher (RS) who recoded the entire set of transcripts. Indexing and coding of themes were discussed with an external qualitative researcher (SS) and reviewed by JH.

The primary researcher (GC) was closely engaged with the research process and the participants and conducted the original RCT study. Potential personal and analytical biases were acknowledged and addressed by reflexive commentary and a reflexive diary maintained during the analytical stages, as a measure of quality assurance.^{14 22} The participant quotes presented in the Results section exemplify the themes described.

Patient and public involvement

Prior to conducting the original RCT, semistructured interviews were performed within a pilot study to determine the acceptability of the TTT and DSD interventions.¹⁰ The present study did not involve participants and/or public in the study design. Results will be disseminated to study participants via this publication.

RESULTS

Participant characteristics

Of the 16 potential participants invited to join the qualitative study, one was unable to participate due to unrelated ill health and hospitalisation (TTT group). Fifteen participants (eight men, seven women), aged 39–69 years (mean 53.3 years, SD 10.3) were recruited and interviewed. Education level ranged from incomplete high school to university degree, and percentage weight change on the programmes ranged from +4.0% to -10.4% which represented the full spectrum of weight change observed in the trial (table 1). Mean values and participant characteristics per intervention are displayed in online supplementary tables 3 and 4.

Theme identification and common themes

Our inductive thematic analysis resulted in 84 categories which were grouped into five key themes relating to the participants' experience of either DSD or TTT interventions (online supplementary table 5). Themes we can construe which have the potential to inform future iterations of these interventions include: (1) novelty of interventions and outcomes, (2) convenience and practicality, (3) indirect health benefits and wellness, (4) accountability and (5) sustainable behaviour change. A conceptual map of themes and codes and additional examples of participant responses are presented in online supplementary figure 1 and online supplementary table 6.

Novelty of interventions and outcomes

Participants in both TTT and DSD interventions typically had previous experience with 'diets' and expressed dislike of these due to their restrictive nature and short-term

Table 1 Participant characteristics

Code	Gender	Age, years	Education level	Weight change during programme, %
TTT				
T1	Male	55	High school	+4.0
T2	Female	69	High school	-3.7
T3	Female	42	University	-4.2
T4	Male	62	Did not complete school	-6.2
T5	Male	39	University	-7.0
T6	Male	54	University	-9.8
T7	Female	50	University	-10.4
DSD				
D1	Male	39	University	-0.9
D2	Male	41	High school	-1.2
D3	Female	49	University	-2.3
D4	Female	56	University	-3.7
D5	Female	64	High school	-4.3
D6	Female	60	High school	-5.0
D7	Male	55	High school	-5.0
D8	Male	65	High school	-10.4

DSD, Do Something Different; TTT, Ten Top Tips.

weight loss outcomes. Participants reported that, in contrast, continuing with the TTT and DSD interventions was manageable long-term as it was a lifestyle change rather than just a quick-fix diet regimen.

I've really tried everything that's been going... Ten Top Tips is more how to fit in a normal lifestyle where you can still live and eat and go out and live what I think is a relatively normal life, you can fit those into your lifestyle and even still have a social life... with the other diets you are much more restricted. [T7]

The point of difference with this programme compared to others it's really changing your life and not putting an end-date on it. It's really more than a weight loss programme; it's almost like a lifestyle programme. [T5]

DSD participants particularly valued the novelty this programme offered, especially the lack of dietary restriction and sustained weight loss.

It is so different! It's not your usual diet and exercise programme, it's something that moves you to thinking differently, not even just consciously but unconsciously. [D7]

All the other diets I've done drove me crazy, I was hungry and I always put the weight back on. I haven't put any weight back on with Do Something Different, I was also never hungry. [D5]

Convenience and practicality

The convenience and practicality of both DSD and TTT were a frequent theme in participants' reflections on the interventions.

The intervention fits in to my lifestyle and daily habits and routines as it's similar to my lifestyle. [T6]

I hardly felt it [the intervention] to be honest, it was just so practical. [D3]

These were intentional features of both interventions.^{11 12} Participants reported TTT and DSD fit into their lifestyles, therefore, demanded only small changes and consequently were easier to both implement and sustain.

It's not like this whole big weight loss programme it's just really good habits to get into that you can incorporate into your life without making huge changes. I think the tips fit in really well with a normal lifestyle so it doesn't take a lot to be able to put them into practice. [T7]

Participants in DSD particularly reported on the method of delivery, stating the text message they received (which enclosed a task for them to complete) was non-obtrusive and convenient. We speculate that the practicality of the intervention also enabled long-term behaviour change.

I still try to do things differently, I'm still more aware of my eating and my exercise, I've changed the way I see things. [D4]

Indirect health benefits and wellness

Participants in the present study were impressed by the indirect 'ripple effect' of health benefits they experienced, beyond just weight loss.

If you take the weight loss side out of it for me, you feel better, sleep better, feel alert, feeling fitter and being about to do more, those benefits are great too even if you don't lose as much weight. I mean, I didn't lose as much as I would have liked, but the benefits of this programme have been excellent in other areas as well. [T5]

I find I'm walking and socialising a bit more. I prioritise things differently now [healthy eating and exercising]. I feel clearer in the head and I have more energy. [D2]

DSD participants reported the programme improved creativity, triggered imagination and was beneficial to mental health.

The programme made me think more and made me more aware of all the things that you do have to do to make a lifestyle change. I actually started looking for more things to do other than what you were texting. I would create little games that would get me out of my routine. [D7]

In addition to this main theme, a subtheme identified was 'self-belief'. Participants repeatedly reported the interventions were enjoyable, supportive and promoted empowerment, self-awareness, self-confidence and self-efficacy. DSD participants particularly reported the intervention increased confidence, especially when out of their comfort zone. The intervention's aim was to break habits by interfering with an individual's habitual behaviours and suggesting tasks often outside their normal routine. Interestingly, the participants felt they gained a great deal of confidence by participating in these tasks.

I'd think, 'yeah I can be into that', 'I can do that' or 'I can try that', 'I can do a 10 kilometre walk'. Before the programme I wouldn't even think about it, I'd think 'well this won't happen'. [D8]

Accountability

A major theme that emerged was the participants' sense of accountability throughout the active intervention period; this included accountability to the researcher, the study and in the TTT group, to the logbook.

You took an interest; it was like someone participating with you rather than just yourself. You know, a phone call is pretty personal. [D8]

Having that someone to check in with you, you feel sort of responsible to them as well to do a good job. [D1]

Participants also described a lack of self-accountability.

I have no self-discipline. If I was left to my own devices and I hadn't come here I know that I would not have lost weight. [D5]

When there's someone there counting on you to do it, it gets you through whereas when no one's interested you think well it doesn't matter it's just me. [T3]

One participant felt a fear of judgement if they had not achieved any weight loss at the follow-up appointment.

The fact that I have to face somebody, and when I face them while they may not be like 'oh why have you put on [weight] this week or why have you not lost more than 0.2 kilos this week' I feel like that's what their opinion is going to be, so it makes it easier to try hard to do what I'm supposed to do or to do the right thing or to make the right choices because I know I've got to face them, and I don't want to face them and the scale's gone up. [T2]

A sense of accountability to the programmes and to the study was reported.

Knowing that I had a number of tasks to do each week kept me focused. [T4]

Being on the programme gave me a reason to focus on losing weight. I felt somewhat accountable to the results. [T3]

Participants in the TTT intervention also reported feeling a sense of responsibility and accountability to the logbook (where participants ticked off when they had successfully completed a task). The logbook was a physical representation of the participants' compliance with the programme. They were required to complete 10 tasks each day and according to participant reports, the more ticks they marked in the logbook, the greater the sense of achievement they would feel.

The logbook always reminds you all the time, like you have to be on track you can't just not worry about it. [T1]

Eventually as the tips sunk in and it got better and then you started feeling much better when you could tick off all the boxes. [T2]

Sustainable behaviour change

Participants emphasised the long-term nature of their sustained results in areas including behaviour change, weight loss and awareness.

A frequent report from TTT participants was that with time, the tasks became automatic and habitual. DSD participants reported that since breaking old habits while on the programme, weight-loss maintenance has been achievable.

I've really got in to those good habits now and I find it easy. It's automatic. The tips are just in my head. [T1]

Everything about weight loss before has been strictly about food, nothing about changing habits. I'd just go off the programme and just pile the weight back on because of old habits but I've maintained my weight loss since Do Something Different. [D6]

Participants reported that changing their habits was uncomfortable and somewhat challenging, especially in the initial stages before they had reached a level of automaticity for those behaviours.

At first some of the tips were really hard and I was like 'I can't do it, I can't do it', but some of the easy ones I focused on and I thought, 'right I'll master the easy ones and try for the harder ones as often as I can' and I guess most of those got easier as well over the twelve weeks. [T3]

DISCUSSION

We have previously shown in an RCT that TTT and DSD interventions achieved significant weight reductions and importantly, weight-loss maintenance from preintervention to postintervention, and postintervention to 12-month follow-up.¹⁰ In this qualitative study, we explored the participants' experiences of these two habit-based weight-loss programmes 6 months after intervention completion. Five key themes emerged, relevant to the implementation of the interventions, influencers of change and general experience of the participants. These

were: (1) novelty of interventions and outcomes, (2) convenience and practicality, (3) indirect health benefits and wellness, (4) accountability and (5) sustainable behaviour change.

Perhaps the most interesting finding was that despite the different mechanisms underlying the two interventions (forming healthy habits vs breaking unhealthy habits), they were viewed similarly by the participants. The interventions were analysed separately, yet common themes emerged from the data. The consistencies between the two are that they are both novel and more convenient to implement compared with regular approaches to weight management.

Conventional weight-loss interventions usually include some form of dietary restriction and/or a structured exercise regimen. The major point of difference between conventional weight-management programmes and TTT and DSD is that these programmes do not focus solely on diet and exercise but follow a habit-based approach. This is novel and participants reported feeling less constrained than with other weight-loss programmes because they could continue most aspects of their current lifestyle and still enjoy a social life which they valued. This point was emphasised during the interviews and contributed to participants continuing with the programme recommendations even after the interventions had concluded. The novelty of these programmes potentially contributed to maintaining new habits which consequently may have resulted in continued and sustained weight loss.

Weight-loss programmes produce better results when they are convenient and practical to implement in daily life.²³ TTT and DSD participants valued the ease and enjoyed the small changes that were a feature of both programmes. TTT participants valued creating new habits through repetition of 10 tips, and DSD participants valued the changes made to their routines by doing different tasks. All participants interviewed reported the interventions fit easily into their normal lifestyle and daily routines. Although not a theme in this study, a previous qualitative exploration of the experience of habit formation in TTT showed that when actions did not easily integrate into existing routines, alternative behaviours were selected.⁸ Furthermore, behaviour change research shows that small and simple tasks can lead to quicker and more successful behaviour changes than more complex tasks.⁴ Current weight-management programmes often require grand and ambitious changes (eg, calorie counting, eliminating food groups, vigorous exercise regimens, etc), but when developing future programmes, consideration should be afforded to encouraging small and subtle changes as these have been shown to produce successful and sustainable change.^{24 25}

The indirect 'ripple effect' of health benefits that participants experienced on the programmes was a key theme. Better sleep, increased energy and alertness, increased well-being, increased confidence and feeling encouraged to exercise were all benefits that participants reported having gained from the programmes independent of how

much weight they lost. These indirect benefits are valued by individuals but often overlooked by clinicians when discussing weight-loss programmes with their clients. Rothman *et al* argued that people with high optimism may be able to switch their focus and priorities on the improvements they experience in different domains to their original outcome goal.²⁶ For example, if a healthy change in diet and exercise does not produce the desired weight loss, an individual may focus on their improved well-being or increased energy levels. Given small weight losses correlate with reduced risk for cardiovascular disease, type 2 diabetes and certain cancers,²⁷ it may be beneficial for clinicians to highlight the indirect benefits of participation in a programme to encourage or help motivate individuals to participate. For example, drinking less alcohol improves sleep and general well-being²⁸ and limiting refined sugar helps balance blood sugar levels leading to increased energy levels and better concentration.²⁹ A focus on tangible health benefits may be a strong motivator and a powerful strategy in behaviour-change interventions.

Another motivator is accountability. Accountability is a strong facilitator to compliance to weight-management efforts and has been demonstrated extensively in previous research.^{30–32} The presence of a perceived support person has been described as a key component to weight-loss interventions, motivating participants to achieve weight loss.²⁷ In fact, just expecting to have to explain one's actions can stimulate conscious thought and alter behaviour.³² Conversely, lack of accountability to someone (including researchers) and an absence of support from others were commonly reported as barriers to achieving weight loss and weight-loss maintenance in a recent qualitative exploration into the facilitators and barriers of weight management.³⁰ Our participants expressed accountability with reference to different aspects of the programmes including the researcher personally, the overall study results and the TTT logbook. But they did not report self-accountability. This is curious given that all but one participant (who gained weight due to an emerging health problem) continued to lose weight after 6 months of no contact with the researchers or the programmes.

Accountability to study investigators was perceived as a key component of the TTT and DSD interventions, motivating and supporting participants to achieve weight loss. Previous research has shown that without an individual (ie, study investigator or clinician) monitoring their progress, participants perceived a drastic drop in motivation for weight-loss maintenance.³³ Because our participants continued to lose weight while not actively enrolled in the intervention, this seems not to be the case. Participants did know that the researchers would contact them in 6 and 12 months to assess progress, but due to the significant time delay between intervention completion and these time points, it is unlikely that these drop-in sessions were enough accountability to motivate weight-loss maintenance. Unlike other weight-loss programmes,

TTT and DSD were founded on habit-based theory; participants engaged in behaviours designed to become 'second nature', which therefore are sustainable long-term. Habits are formed by repeating a behaviour until it becomes automatic.⁵ Once a habit is established, the behaviour is performed unconsciously, without reflection, deliberation or awareness.¹³ When healthy diet and exercise habits are formed, healthy weight and lifestyle are easier to maintain.²⁴ This may explain their continued weight loss without regular external monitoring or accountability. We hypothesise that weekly monitoring may have improved retention; however, further research is required to make such conclusions.

Interestingly, health-promoting actions which are extrinsically motivated (ie, satisfy external demands, comply with instructions or avoid punishments) are theoretically less likely to be sustained than actions pursued due to genuine personal interest (ie, intrinsic motivation).³⁴ Therefore, intervention developers are encouraged to promote behaviours in a way that encourages individuals to internalise the need and desire for change, therefore prompting self-determined, rather than compliant behaviour change.³⁵

Feelings of satisfaction are important in maintaining new behaviours as they validate the initial decision to change behaviour.³⁶ Once a novel behaviour has been initiated, self-monitoring draws attention to this behaviour, making it easier to recognise compliance and achievement of behavioural goals.^{4,33}

Participants have reported that habit change during the initial stages of the TTT intervention has been challenging which is consistent with previous experiences of habit formation⁸ and with evidence that shows a persistent level of conscious thought is required to perform a new behaviour each day to establish a habit⁶; this can be exhausting and discouraging. Therefore, it is important to reassure weight-management clients that performing a new behaviour will progressively get easier as automaticity of that behaviour strengthens. Hence, maintaining motivation to consistently perform the new behaviour is only necessary until the habit forms and the new behaviour becomes 'second nature'.²⁴

INTERVENTION COMPARISON

Despite participants in both interventions achieving similar quantitative outcomes at postintervention and 12-month follow-up,¹⁰ participants expressed some differences in their perceptions at the 6-month interview. TTT participants expressed a sense of accountability to the logbook whereas DSD participants did not report accountability to the online platform used to self-monitor their progress. TTT participants may have felt more engaged with the logbook because of the frequency of tasks and the physical representation of their compliance when the logbook was completed. TTT involved daily engagement of 10 individual tasks with daily self-monitoring, whereas DSD involved only 3–4 tasks a week.

Another difference between the interventions was that DSD participants reported an increase in confidence postintervention, especially when out of their comfort zone; TTT participants did not report a change in confidence. This could be due to the nature of tasks on the DSD programme which explicitly encouraged participants to increase their behavioural repertoire and perform tasks out of their usual routines and comforts. Therefore, experiencing the discomfort of performing a novel task was well practised among DSD participants; whereas TTT participants repeatedly performed the same tasks each day.

Lastly, participants in the two programmes differed somewhat in the way they described automaticity. TTT participants experienced automaticity of some of their new behaviours. DSD participants made the conscious decision to continue to do something different. This could be due to the repetitive nature of the TTT programme; repetition creates automaticity of that behaviour.

Strengths and limitations

This study offers insight into why habit-based interventions might work and builds on previous research.⁸ A prior qualitative study looked at experiences of habit formation.⁸ The present study explored experiences of an approach that focused on breaking old habits and forming new habits. The findings generated some practical recommendations for effective promotion of healthy habits and weight-loss maintenance; for example, recommending small changes, the importance of external accountability and the lack of need for restrictive diet regimens.

Qualitative methods can provide rich and diverse data that is not obtainable through quantitative means, and semistructured interviews were ideal to explore participants' in-depth lived experiences of the interventions. Using purposeful maximum variation sampling to select the participants potentially allowed for heterogeneous responses across a diverse range of participants from varied ages, education levels, genders and extent of weight change on the programmes. Two experienced researchers independently analysed the data and agreed on the themes and subthemes. This achieved data trustworthiness and ensured no common themes were missed. Importantly, our qualitative data supported the quantitative findings of our RCT.¹⁰ For example, the participants' comments on sustained behaviour change aligns with their continued weight loss at follow-up.

As in all lifestyle intervention studies, participation in the RCT was voluntary, and this may mean our participants were more motivated to lose weight than community members who chose not to participate. This would likely have resulted in improved outcomes for study participants in comparison with unmotivated individuals in the community. However, our purpose in this qualitative study was to understand the experiences of individuals who do take part in a structured weight management programme, and we used a maximum variation method to

select participants. Therefore, we have broad and varied experiences of individuals from the two programmes from which to draw conclusions. It is possible that participants may have felt grateful to GC for the weekly phone calls throughout the intervention and therefore may have wanted to say positive things about the programme. The research team discussed this limitation prior to the study commencing and attempted to address it by explicitly asking for burdens of implementation, for example, 'What was the lowlight of the programme?' and 'Were there any tasks you found particularly difficult on the programme?' Participants were also given the opportunity to provide any feedback or comments on how they thought the programmes could be improved. Further research specifically aimed to explore the underlying mechanisms of forming new habits and breaking old habits could be insightful and would add to the current body of evidence.

CONCLUSIONS

The themes generated in this qualitative analysis showed that participants in two different habit-based weight-loss interventions had overall positive experiences while on the programmes and continued to report self-perceived benefits long after the interventions had concluded. In our studies, most participants in TTT and DSD achieved clinically significant weight loss during the 12-week programmes and weight-loss maintenance over 6–12 months.¹⁰ Participants in these qualitative interviews reported that the habit-based intervention strategies were simple and practical to implement and maintain in daily life and therefore, compared favourably with typical lifestyle programmes for weight control.

Considerations for future interventions

- ▶ Include strategies for sustainable behaviour modifications which allow participants to live close to their current lifestyle by recommending small, manageable changes.
- ▶ Interventions should be convenient and practical to implement in daily life, taking into consideration the individual's work, family and other commitments.
- ▶ Highlight the non-weight focused health benefits of the programme such as: better sleep, improved general well-being, increased confidence and increased energy levels.
- ▶ Incorporate external accountability strategies in the form of a support person and tangible self-monitoring tools.

Acknowledgements Thanks to Dianne Reidlinger for early input into the development of the interview schedule and to Rebecca Sims and Sally Sargeant for invaluable involvement in data extraction and analysis. And a huge thanks to all the participants who contributed so generously in the interviews.

Contributors GC and RT conceived the trial. GC conducted and analysed the interviews. GC wrote the first draft of the manuscript and JH and RT provided extensive feedback and contributed to the final paper.

Funding This research was supported by an Australian Government Research Training Program Scholarship. JH is supported by an NHMRC Early Career

Fellowship (APP1112509), RT is supported by an NHMRC Program Grant (APP1113532).

Competing interests None declared.

Patient consent Not required.

Ethics approval Ethics approval was obtained from the Bond University Human Research Ethics Committee (R01888B).

Provenance and peer review Not commissioned; externally peer reviewed.

Data sharing statement No additional data are available.

Open Access This is an Open Access article distributed in accordance with the Creative Commons Attribution Non Commercial (CC BY-NC 4.0) license, which permits others to distribute, remix, adapt, build upon this work non-commercially, and license their derivative works on different terms, provided the original work is properly cited and the use is non-commercial. See: <http://creativecommons.org/licenses/by-nc/4.0/>

© Article author(s) (or their employer(s) unless otherwise stated in the text of the article) 2018. All rights reserved. No commercial use is permitted unless otherwise expressly granted.

REFERENCES

1. Ng M, Fleming T, Robinson M, *et al*. Global, regional, and national prevalence of overweight and obesity in children and adults during 1980–2013: a systematic analysis for the Global Burden of Disease Study 2013. *Lancet* 2014;384:766–81.
2. Roqué i Figuls M, Martínez Gracia L, Martínez-Zapata MJ, *et al*. Interventions for treating overweight or obesity in adults: an overview of systematic review (Protocol). *Cochrane Libr* 2013;8.
3. Jeffery RW, Drewnowski A, Epstein LH, *et al*. Long-term maintenance of weight loss: current status. *Health Psychol* 2000;19(1S):5–16.
4. Lally P, Gardner B. Promoting habit formation. *Health Psychol Rev* 2013;7(sup1):S137–S158.
5. Nielsen P, Roback K, Broström A, *et al*. Creatures of habit: accounting for the role of habit in implementation research on clinical behaviour change. *Implementation Science* 2012;7:53.
6. Lally P, van Jaarsveld CHM, Potts HWW, *et al*. How are habits formed: Modelling habit formation in the real world. *Eur J Soc Psychol* 2010;40:998–1009.
7. de Bruijn G-J, Kroeze W, Oenema A, *et al*. Saturated fat consumption and the Theory of Planned Behaviour: Exploring additive and interactive effects of habit strength. *Appetite* 2008;51:318–23.
8. Lally P, Wardle J, Gardner B. Experiences of habit formation: A qualitative study. *Psychol Health Med* 2011;16:484–9.
9. Fletcher B, Page N, Pine K. A new behavioural intervention for tackling obesity: Do something different. *Agro Food Ind Hi-Tech* 2007;18:8–9.
10. Cleo G, Glasziou P, Beller E, *et al*. Habit-based interventions for weight loss maintenance in adults with overweight and obesity: a randomized controlled trial. *Int J Obes* 2018;39.
11. Lally P, Chipperfield A, Wardle J. Healthy habits: efficacy of simple advice on weight control based on a habit-formation model. *Int J Obes* 2008;32:700–7.
12. Fletcher B, Hanson J, Page N, *et al*. FIT - do something different: A new behavioral program for sustained weight loss. *Swiss J Psychol* 2011;70:25–34.
13. Cleo G, Isenring E, Thomas R, *et al*. Could habits hold the key to weight loss maintenance? A narrative review. *J Hum Nutr Diet* 2017;30:655–64.
14. Tong A, Sainsbury P, Craig J. Consolidated criteria for reporting qualitative research (COREQ): a 32-item checklist for interviews and focus groups. *International Journal for Quality in Health Care* 2007;19:349–57.
15. Beeken RJ, Leurent B, Vickerstaff V, *et al*. A brief intervention for weight control based on habit-formation theory delivered through primary care: results from a randomised controlled trial. *Int J Obes* 2017;41:246–54.
16. Fletcher B, Pine K. *Flex: Do Something Different*. Chicago: University Of Hertfordshire Press, 2012.
17. Pine K, Fletcher Ben (C), Fletcher B. Time to shift brain channels to bring about effective changes in health behaviour. *Perspect Public Health* 2014;134:16–17.
18. Barbour RS. Checklists for improving rigour in qualitative research: a case of the tail wagging the dog? *BMJ* 2001;322:1115–7.

19. Sharifi N, Mahdavi R, Ebrahimi-Mameghani M. Perceived Barriers to Weight loss Programs for Overweight or Obese Women. *Health Promot Perspect* 2013;3:11–22.
20. Ritchie J, Lewis J, Nicholls CM, et al. *Qual Res Pract*. 2nd ed: Sage, 2014.
21. Braun V, Clarke V. Using thematic analysis in psychology. *Qual Res Psychol* 2006;3:77–101.
22. Willig C. *Introducing Qualitative Research in Psychology: Adventures in Theory and Method*. 2nd ed: Buckingham: Open University Press, 2008.
23. Gul RB, Ali PA. Clinical trials: the challenge of recruitment and retention of participants. *J Clin Nurs* 2010;19:227–33.
24. Gardner B, Lally P, Wardle J. Making health habitual: the psychology of 'habit-formation' and general practice. *British Journal of General Practice* 2012;62:664–6.
25. Wood W, Tam L, Witt MG. Changing circumstances, disrupting habits. *J Pers Soc Psychol* 2005;88:918–33.
26. Rothman AJ, Sheeran P, Wood W. Reflective and Automatic Processes in the Initiation and Maintenance of Dietary Change. *Annals of Behavioral Medicine* 2009;38(S1):4–17.
27. Dalle Grave R, Centis E, Marzocchi R, et al. Major factors for facilitating change in behavioral strategies to reduce obesity. *Psychol Res Behav Manag* 2013;6:101–10.
28. Stein MD, Friedmann PD. Disturbed Sleep and Its Relationship to Alcohol Use. *Subst Abuse* 2006;26:1–13.
29. Jenkins DJA, Kendall CWC, Augustin LSA, et al. Glycemic index: overview of implications in health and disease. *Am J Clin Nutr* 2002;76:266S–73.
30. Metzgar CJ, Preston AG, Miller DL, et al. Facilitators and barriers to weight loss and weight loss maintenance: a qualitative exploration. *Journal of Human Nutrition and Dietetics* 2015;28:593–603.
31. Carels RA, Burmeister JM, Koball AM, et al. A randomized trial comparing two approaches to weight loss: Differences in weight loss maintenance. *J Health Psychol* 2014;19:296–311.
32. Baumeister RF, Masicampo EJ, Vohs KD. Do Conscious Thoughts Cause Behavior? *Annu Rev Psychol* 2011;62:331–61.
33. Burke LE, Swigart V, Warziski Turk M, Turk MW, et al. Experiences of Self-Monitoring: Successes and Struggles During Treatment for Weight Loss. *Qual Health Res* 2009;19:815–28.
34. Ryan RM, Deci EL. Self-determination theory and the facilitation of intrinsic motivation, social development, and well-being. *Am Psychol* 2000;55:68–78.
35. Deci EL, Ryan RM. *Intrinsic motivation and self-determination in human behavior*. New York: Plenum Press, 1985.
36. Rothman AJ. Toward a theory-based analysis of behavioral maintenance. *Health Psychology* 2000;19:64–9.