Appetite 193 (2024) 107138

Contents lists available at ScienceDirect

Appetite

journal homepage: www.elsevier.com/locate/appet

Experiences of emotional eating in an Acceptance and Commitment Therapy based weight management intervention (SWiM): A qualitative study

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ARTICLE INFO

Keywords:
Emotional eating
Acceptance and Commitment Therapy
Weight management

ABSTRACT

Background: Emotional eating is a barrier to weight management. Interventions based on Acceptance and Commitment Therapy (ACT) promote the acceptance of uncomfortable feelings, which can reduce the urge to use food as a coping mechanism. We aimed to explore how participants of an ACT-based weight management intervention (WMI) experience emotional eating and relevant intervention content.

Methods: We conducted semi-structured telephone interviews with participants of a digital ACT-based guided self-help WMI. Fifteen participants were purposefully selected to represent a range of demographic characteristics and emotional eating scores. We used reflexive thematic analysis to explore experiences of emotional eating.

Results: We generated five themes. Participants improved emotional eating by disconnecting emotions from behaviours though increased self-awareness (theme 1) and by implementing alternative coping strategies, including preparation, substitution, and acceptance (theme 2). Most participants maintained improvements in emotional eating over time but wished for more opportunities to re-engage with intervention content, including more immediate support in triggering situations (theme 3). Participants who struggled to engage with emotional eating related intervention content often displayed an external locus of control over emotional eating triggers (theme 4). The perceived usefulness of the intervention depended on participants' prior experiences of emotional eating, and was thought insufficient for participants with complex emotional experiences (theme 5).

Discussion: This ACT-based WMI helped participants with emotional eating by improving self-awareness and teaching alternative coping strategies. Intervention developers may consider adding ongoing forms of intervention that provide both real-time and long-term support. Additionally, a better understanding of how to support people with an external locus of control and people with complex experiences of emotional eating is needed. Future research may explore ways of personalising WMIs based on participants' emotional needs.

1. Introduction

Obesity is associated with an increased risk of multiple adverse health outcomes, such as diabetes, other metabolic diseases, and several types of cancer (World Health Organization, 2021). Standard behavioural treatments can achieve short-term weight loss, leading to meaningful improvements in health, such as a reduced likelihood of developing diabetes (Hartmann-Boyce et al., 2014; LeBlanc et al., 2018; Twells et al., 2021). However, long-term weight loss maintenance remains a major challenge in the successful treatment of obesity (MacLean et al., 2015, 2018). A review of qualitative studies on the experience of sustained weight loss found that emotional eating, defined as the tendency to eat more in response to negative emotions that are not well regulated, was often identified as a major barrier to weight loss maintenance (Spreckley et al., 2021). As such, interventions targeting emotional eating might be helpful.

Weight management interventions (WMIs) based on Acceptance and

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https://doi.org/10.1016/j.appet.2023.107138
Received 7 August 2023; Received in revised form 20 November 2023; Accepted 21 November 2023
Available online 26 November 2023

Abbreviations

ACT	Acceptance and Commitment Therapy
WMI	Weight Management Intervention
LOC	Locus of Control
PPIE	Patient and Public Involvement and Engagement

Commitment Therapy (ACT) promote the acceptance of unwanted and uncomfortable thoughts, emotions, and sensations, which may help reduce the urge to rely on food to overcome these internal experiences. Systematic reviews and meta-analyses have found that interventions using ACT reduce emotional eating (di Sante et al., 2022) and might be more effective than standard behavioural treatments for long term weight management (Lawlor et al., 2020). However, relatively little is known about how emotional eating is experienced and perceived from the perspectives of those participating in an ACT-based WMI. This limits our understanding of whether and how ACT based WMIs can help with emotional eating, including how support with emotional eating can be improved in future interventions.

In a qualitative study exploring logbooks of participants of an ACT-based WMI, emotional eating was noted to be a concern for the participants who lost the least weight (Kasila et al., 2020). It was unclear whether those who lost more weight experienced improvements in their emotional eating, or whether specific intervention components were perceived to be particularly useful to support their management of emotional eating. Previous research by Frayn et al., 2018 has explored which strategies people with high levels of emotional eating apply to regulate their weight. Identifying triggers of emotional eating and choosing an alternative coping mechanism were most helpful. These strategies are often also included in ACT-based WMIs. However, the participants were a group of university students with a BMI <25 km/m^2. In a weight management context, Jones et al., 2022 reported that participants of an ACT-based WMI expressed different preferences from the intervention based on their emotional needs. This could suggest that participants' experiences of ACT-based WMIs might differ depending on their levels of emotional eating. As specific questions and prompts for emotional eating were not used by Jones and colleagues, the insights concerning emotional eating experiences remains limited. A better understanding of the experiences of emotional eating during an ACT-based WMI, including the strategies that help or hinder emotional eating, would allow us to develop new hypotheses on how to better address emotional eating in WMIs.

1.1. Aims and objectives

In this qualitative study, we explored participants' experiences of emotional eating during an ACT-based weight loss maintenance intervention. Specifically, we explored their opinions and perspectives on the emotional eating-specific intervention content, any changes to emotional eating they experienced, and any strategies that they perceived to impact their emotional eating.

2. Methodology

2.1. Design and setting

This qualitative study was embedded in the feasibility evaluation of the SWiM (Supporting Weight Management) trial (Ahern et al., 2022). The trial was preregistered (ISRCTN12107048) and ethical approval was obtained from the Cambridge Psychology Research Ethics Committee (Application No: PRE.2020.049) on 24/04/2020. Participants were randomised to either the SWiM intervention or a control group with a 2:1 allocation stratified by sex and diabetes status.

2.1.1. The SWiM intervention

SWiM is an online, guided self-help, ACT-based weight loss maintenance intervention. Full details of intervention content are described elsewhere (Richards et al., 2022). In brief, it consists of 14 weekly web-based modules that target key challenges in weight loss maintenance. Modules included psycho-educational content with metaphorical examples, reflective exercises, and behavioural tasks based on the six core ACT principles of (1) acceptance, (2) cognitive defusion, (3) present-moment awareness, (4) self as context, (5) values and (6) committed action (Hayes, 2004; Hayes et al., 2006) as well as key techniques from standard behavioural programmes. Participants received four scripted calls from trained non-specialist 'SWiM coaches' during the intervention, and they could request up to three additional calls. One module in the SWiM intervention (Session 6: Emotional Eating) was directed at emotional eating specifically. It provided a definition of emotional eating and content on how to break the cycle of emotional overeating and feelings of guilt and self-blame. It also included an 'emotional responses diary' exercise which encouraged participants to identify triggers for emotional eating, find an alternative activity to soothe emotions, and reflect on the effects of implementing such alternative behaviours.

2.1.2. Control group

The control group received a two-page leaflet providing advice on how to make a personalised weight maintenance plan.

2.2. Recruitment and participant selection

Participants were eligible for the SWiM trial if they were >18 years old, had previously completed a behavioural WMI of at least 12 weeks duration within the last three months, owned a set of scales, and were able to access the SWiM website from a laptop, computer, or tablet. Participants with previous or planned bariatric surgery, who were or planned to become pregnant during the study period, used insulin, or had a current diagnosis of an eating disorder under the DSM-5 criteria were not eligible to take part.

We purposefully selected fifteen participants from the intervention arm of the trial based on a range of demographic characteristics (age, sex, ethnicity, occupation) and emotional eating scores on the Three Factor Eating Questionnaire (Stunkard & Messick, 1985; Tholin et al., 2005) with the intention to represent a variety of experiences within the wider population of the SWiM trial. We continuously evaluated the number of participants included based on the information power principle until deemed sufficient (Braun & Clarke, 2021; Malterud et al., 2016). Participants provided informed e-consent to participation and audio recording of the interviews. After completing interviews, participants were given £10 Amazon gift vouchers as honorarium. Participant characteristics are summarised in Table 1.

2.3. Data generation

Semi-structured qualitative interviews were conducted via telephone by a female PhD candidate researcher (LK) with training in qualitative research and a background in health psychology. Phone calls were between the researcher and participant only, with no one else known to be present. The interview schedule (Supplementary material) was developed by the wider research team, with LK leading the development of questions related to emotional eating experiences. The interview schedule was piloted by LK with a postdoctoral researcher (RR), and a patient representative (GP). Interviews were audio recorded with the participants' permission using dictaphones. Interviews ranged in duration from 25 min to 1 h 10 min, with an average of 51 min. A reflexive journal entry was made upon completion of each interview to aid the data analysis process. Audio recordings were transcribed by an experienced external agency and internally quality checked for accuracy.

Table 1
Baseline characteristics of participants.

Characteristics	Number of Participants *(unless indicated otherwise)*
Age (mean [min- max])	55 [24–73]
Sex	
Male	2
Female	13
Ethnicity	
White	14
Asian	1
Employment Status	
Full-time job (more than 30 h)	5
Part-time job (less than 30 h)	2
Voluntary work	1
Retired	3
Part-time education	1
Permanently sick/disabled	1
Other (unemployed but not looking for employment due to health issues)	1
Missing	1
Emotional eating scores on the Three Factor Eating Questionnaire (TFEQ-R21) at baseline (higher scores represent more emotional eating) (mean [min- max])	57.41 [16.67–83.34]
Self-reported changes (at interview) in emotional eating over the duration of the intervention for those that described experiencing emotional eating	
Improvements in emotional eating	8
No improvement in emotional eating	3
Emotional eating already well managed before joining SWiM with no further improvements needed	2
No experience of emotional eating with no further improvements needed	2
Body Mass Index (BMI) at baseline (kg/m^2) (mean [min- max])	37.43 [28.12–49.54]
Self-reported changes in weight (at interview) over the duration of the intervention	
Lost weight	7
Gained weight	2
No change in weight/maintained weight	3
Not sure	3

2.4. Data analysis

We used reflexive thematic analysis to explore patterns of meanings across the dataset (Braun & Clarke, 2021). Thematic analysis is considered appropriate for work that is exploratory in nature and it is suited to exploring people's thoughts, feeling, experiences, and perspectives. Although ACT is based on an established theoretical background and proposes mechanisms of action by which these types of treatment work, we are not aware of any appropriate theoretical frameworks specific to emotional eating. As such, we took an exploratory approach for the analysis. We iteratively and flexibly followed the six phases of thematic analysis outlined by Braun & Clarke, 2021, including (1) familiarisation, (2) coding, (3) generating initial themes, (4) developing and reviewing themes, (5) refining, defining, and naming themes, and (6) producing the report (Braun & Clarke, 2021).

Data analysis was led by LK. A subset of eight transcripts were coded in duplicate by CH (N = 2), MT (N = 3) and AV (N = 3) to follow a 'collaborative coding' approach that facilitates the sharing of ideas and encourages a challenging of one another's assumptions (Braun & Clarke, 2021). The aim of collaborative coding was not to reach a consensus, but to identify any aspects that might have been overlooked by just one researcher alone and to enhance the depth and richness of data analysis. We practiced reflexivity by critically questioning how our personal background and positionality (e.g. insider and outsider perspective) may have influenced our interpretation of interview excerpts. LK and CH kept a reflexive journal to document this process, and AV and MT shared reflexive thoughts during dedicated meetings with LK. For example, LK is a female PhD researcher with a BMI <25 kg/m2 and no personal experience of weight loss. CH is a general practitioner and bariatric physician by background with experience of running emotional eating groups for patients with obesity. MT and AV are patient representatives that identify as living with obesity. Researchers involved in data analysis engaged in regular discussions about the developing findings with the wider research team as part of the iterative analysis process. We used NVivo software to support data analysis and management (QSR International Pty Ltd., 2022).

2.5. Patient and Public Involvement and Engagement (PPIE)

Extensive PPIE input was sought in the development of the main SWiM trial (see Ahern et al., 2022). A patient representative (GP) piloted the interview schedule for this study. Two additional PPIE representatives (MT and AV) collaborated as co-authors. They coded a subsection of the transcripts, challenged the development of themes in several meetings, and reviewed the manuscript. Sharing their lived experience during the development of themes helped refine the focus and scope of themes. In particular, MT and AV stressed the importance of the experience of participants with more severe forms of emotional eating and potential underlying mental health disorders, which shaped the way theme five was presented and interpreted.

3. Analysis

We developed five themes exploring participants' experiences of emotional eating during this ACT-based WMI. The first theme describes how the intervention influenced participants understanding of themselves and their internal experiences related to emotional eating. The second theme describes cognitive and behavioural coping strategies that participants implemented into their daily lives to manage their emotional eating. The third theme describes how participants used and engaged with the emotional eating content over time. The fourth theme describes how participants experienced external triggers of emotions to impact their ability to engage with emotional eating related intervention content and manage their emotional eating. Finally, the fifth theme describes how differences in participants' prior management and complexity of emotional eating influenced how relevant they perceived the intervention content to be. Quotes will be followed by the participant number, sex, age and baseline emotional eating scores on the Three Factor Eating Questionnaire (TFEQ-R21) (Stunkard & Messick, 1985; Tholin et al., 2005) (e.g. P1, female, 61y, EE 61.1).

3.1. Theme 1: Increased self-awareness of emotions and physiological states

Participants described that emotional eating typically is *"a subconscious thing"* (P6, male, 70y, EE 50.0) or *"an automatic response"* (P1, female, 61y, EE 61.1), and that SWiM encouraged self-observation of emotional eating in the moment and reflection after the event. Participants explained that consciously reflecting on emotional eating helped them to identify triggers. This included recognising both the emotions that prompt overeating, such as feeling stressed, bored, angry, or upset, as well as identifying the events and situations that trigger these emotions, such as work-related problems, conflicts with friends and family, or health issues.

> *"I think for me a trigger is thinking (…) I've done something wrong at work. That anxiety for me, I hadn't realised was such a strong trigger. So it [the SWiM programme] highlighted that so now I'm aware of that."*
>
> P9 (female, 56y, EE 61.1)

Additionally, participants described gaining an increased awareness of their internal states by observing their experience of an urge to eat in the moment, and how they felt before and after eating in response to it. Participants' descriptions of this sense of internal states included being able to distinguish cravings and emotional needs from the physiological experiences of hunger and fullness. This self-observation was described

to sometimes lead to changes in how participants perceived food and eating. For example, some participants shared that they realised that food was not going to improve their stress or mood as originally assumed. Others noticed that they did not enjoy the food as much as they thought they would.

> *"I used to think like you know me being stressed and food's going to help, it's going to help me, it's going to make me happy, but no, it's not. You know, me writing afterwards how it made me feel, like even me writing that down it helped me"*
>
> P2 (female, 33y, EE 77.8)

> *"I sort of become a benevolent observer of myself and I go oh, you haven't finished your wine, ah, that's interesting. Do you want to finish it or … ? (…) you don't particularly want to drink it because you're not actually enjoying it as much as you thought you were"*
>
> P9 (female, 56y, EE 61.1)

Improved self-awareness helped participants to slow down the automaticity of the emotional eating response and to make a more deliberate decision about how to respond to an urge to eat. Many participants reported they would now *"stop and think"* (P9, female, 56y) before eating. This allowed them to disconnect emotions from the automatic eating response. They described that they would reflect on what caused their urge to eat and evaluate whether that aligned with what they believed to be valid reasons to eat – in particular, participants compared eating in response to the physiological experience of hunger as opposed to emotional cues.

> *"[The SWiM programme] certainly made me more aware of no, I'm not hungry, I might be bored, or I might be a bit fed up or something's upset me. But it doesn't mean you need to go to the cupboard and eat something."*
>
> P3 (female, 59y, EE 77.8)

Increased self-awareness alone might not be sufficient to improve emotional eating. One participant highlighted that while the intervention has made them more aware of emotional eating, it did not *"change it [emotional eating]"* (P6, male, 70y, EE 50.0).

3.2. Theme 2: Coping strategies other than emotional eating

Participants reporting that SWiM helped them to manage their emotional eating described using a combination of different strategies to cope with the experience of negative emotions, and to uncouple these from their eating behaviour. We categorised strategies into 3 groups: Preparation, substitution and acceptance.

Preparation strategies included trying to prevent an emotional eating event by altering their shopping habits and home food environment to *"keep temptation away"* (P13, female, 66y, EE 44.4) and finding ways to circumvent known triggers of emotions, for example by preparing food in a way that family members won't make triggering comments.

> *"I tend not to buy things, you know, like that [biscuits] because I still don't feel necessarily strong enough to fight the emotional eating urges."*
>
> P11 (female, 57y, EE 55.6)

Substitution strategies included swapping their typical emotional eating food with a *"suitable"* food alternative that is *"more healthy"* (P13, female, 66y, EE 44.4), eating smaller amounts of their typical food, or substituting eating with a non-food related activity, such as knitting, calling a friend or sitting outside.

> *"If I'm having a bad day, thinking, "well, it's rubbish, I'm going to go and have something to eat." I'd stop and think and go and do something else instead."*
>
> P3 (female, 59y, EE 77.8)

Acceptance strategies included letting themselves feel the emotion or experience the emotional eating trigger without acting on it, letting it *"flow over"* them (P9, female, 56y, EE 61.1). One participant reported that this helped them to feel like the experience was *"not so bad"* (P8, female, 55y, EE 77.8).

> *"I think (…) that if you're angry you don't need to eat, you just need to be and don't kill anyone. [laughs] (…) Allow yourself to feel the anger but don't act, and if you need to act on something, act when you're calm later on. I had a situation like that myself recently and I followed that path and it was great"*
>
> P9 (female, 56y, EE 61.1)

3.3. Theme 3: Use and implementation of emotional eating content over time

As time passed, participants who found the SWiM content helpful to manage their emotional eating reported not using the intervention content as regularly anymore. They felt that using the strategies they had implemented from the programme to manage emotional had become a new habit.

> *"I think over the last 3 months the SWiM project has probably become more of a way of life for me and it's more natural, I don't need to think about it. It sort of comes into my sub-conscious."*
>
> P1 (female, 61y, EE 61.1)

However, changing emotional eating was perceived to be a long process and participants stressed that it will take a long time to fully *"undo"* the habit of emotional eating (P1, female, 61y, EE 61.1), and that *"we mustn't underestimate how long it takes"* to form new eating habits (P9, female, 56y, EE 61.1). Consequently, even participants who were maintaining changes to emotional eating wanted more opportunities to re-engage with the emotional eating content and suggested to *"set up reminders"* (P9, female, 56y, EE 61.1) for that purpose. In particular, participants reported wanting more support in moments they felt at risk of emotional eating; for example, during menstruation (P2, female, 33y, EE 77.8). Participants described feeling that they would benefit from more immediate support in emotionally challenging moments. While this included moments where the emotion is acutely experienced, support may also be needed some time after the acute phase of experiencing the emotion. For example, participants said they were likely to engage in emotional eating when rewarding oneself for having *"managed to get through [a bad or a particularly challenging day]"* (P1, female, 61y, EE 61.1) or when *"things haven't gone quite as you'd planned in a day or over a week and you get to the weekend"* (P4, male, 61y, EE 33.3). Suggestions for more time sensitive support included drop-in sessions with coaches instead of scheduled calls (P11, female, 57y, EE 55.6), an audio recording or *"emergency podcast"* that is directed at calming emotions and providing guidance when feeling at risk of emotional eating (P8, female, 55y, EE 77.8), and an area to store personal favourite metaphors for facilitated access (P9, female, 56y, EE 61.1; P11, female, 57y, EE 55.6). Some participants also stressed the importance of using a mobile application rather than a computer programme, as this would allow quicker and easier access to emotional eating content. Additionally, as participants reported using the intervention website less regularly over time, some said to have forgotten where to find specific emotional eating content and felt it became harder to navigate the intervention website when needed. For continued use of the intervention over time, they suggested a *"chatbot"* (P11, female, 57y, EE 55.6) or a searching feature that would assist in locating specific content.

3.4. Theme 4: perceived control over external emotional eating triggers

Participants' ability to engage with the intervention and consequently manage their emotional eating depended on their perceived control over responding to situations that would trigger emotions. For

example, some participants described to find it harder or even impossible to manage emotional eating when there were *"a lot of other things going on"* (P5, female, 50y, EE 72.2) or when feeling *"poorly"* (P13, female, 66y, EE 44.4). These situations triggering emotions were perceived to be external and uncontrollable. Examples included health and mobility problems, pain, social stress, financial and work-related stress (e.g., unemployment), as well as ongoing shielding related to the Covid-19 pandemic. Some participants felt like they would only be able to engage with the emotional eating content in SWiM once the triggers of emotions themselves had resolved. This either caused them to believe it was not the right time to engage with the intervention, or it disrupted their ability to maintain changes to emotional eating.

> *"I'm not sure yet [how to address the challenge of experiencing pain and emotions in the future] [sighs] because I'm just constantly worrying about my mum's health of course [cancer diagnosis]. If she (…) will get better, it will calm down my emotions."*
>
> P14 (female, 35y, EE 72.2)

> *" [The SWiM programme] did [change emotional eating] when I was on the programme but then now I've come off I've kind of just reverted back to what I used to do (…) because as I mentioned I've got mobility issues and I think I'm more stressed because of that, because I'm getting all these tests done to see what's wrong."*
>
> P7 (female, 24y, EE 83.3)

Other participants learned to accept the uncontrollable nature of external circumstances that might trigger emotions during SWiM. They also learned that, while they could not control the original trigger of emotions, they could control their reaction to the trigger and the associated emotions. This allowed them to engage in alternative behaviours in the presence of external and uncontrollable triggers of emotions.

> *"Something that (…) I've definitely worked on is that a lot of things you can't control and then they're quite irritating when you can't control them. You can't control people, you can't control external circumstances, and sometimes you just do have to let go and just think, you know, okay, I can't control this but what I can control is my reaction to it."*
>
> P9 (female, 56y, EE 61.1)

3.5. Theme 5: Influence of previous experience and management of emotional eating

Differences in prior experiences and management of emotional eating influenced how participants perceived and used the intervention content. A minority of participants did not relate to the experience of emotional eating and felt that this content was irrelevant to them. One of them wished to skip the emotional eating content (particularly the emotional eating diary) for that reason (P10, female, 73y, EE 16.7); another said they did not find the content interesting and had problems remembering it (P12, female, 69y, EE 27.8).

> *"I think when you find out if you're not [emotional eating] in the first place then you should say skip to the next bit, you know? As opposed to having to go in and, you know, say what you're going to do on this occasion, or give you a question and then how you react to it, well you don't overeat, you know, it's filling that in all the time."*
>
> P10 (female, 73y, EE 16.7)

Other participants reported that they already knew their triggers of emotional eating well. For example, through *"counselling training"* and *"personal therapy"* (P15, female, 60y, EE 50.0) or having *"been through a lot of (…) sadness"* (P1, female, 61y, EE 61.1). These participants also said that they *"already had a good handle on [emotional eating]"* (P15, female, 60y, EE 50.0). However, they reported that SWiM served as a good reminder and helped them to view things from a different perspective.

> *"A lot of the SWiM course I already knew, (…) so a lot of that felt like revision which actually is good because (…) it's good to be reminded of things sometimes. (…) I didn't feel like it was a nuisance" "A lot of [the SWiM programme] was (…) putting things in a slightly different way that somehow made a penny drop or, you know, that hadn't quite happened before"*
>
> P15 (female, 60y, EE 50.0)

Most participants who struggled with emotional eating previously found the SWiM programme helpful to improve their management of emotional eating by increasing self-awareness (Theme 1) and providing alternative coping strategies (Theme 2). However, some participants felt they needed more intensive support than was provided in SWiM to reflect the complexity of their emotional eating experience.

> *"Sometimes within the programme it seems quite simplistic, and in my head, (…) I can't talk about other people's brains, it isn't as simplistic as what it's coming across in the programme."*
>
> P5 (female, 50y, EE 72.2)

It appeared that some participants felt their emotional eating was too complex to be addressed properly by the intervention. Other participants who wanted more support also indicated more complex emotional eating. For example, one participant disclosed that their emotional eating was linked to stressful and potentially traumatic experiences from their time as a young carer. They felt that the intervention did not go *"far enough to (…) determine the cause [of emotional eating] and to try and stop it"* (P7, female, 24y, EE 83.3) and they wished to further explore the origins of their emotional eating.

> *"[My childhood] was kind of stressful (…) because I was a young carer and I would emotionally eat (…) to try and stop thinking about everything that's going on" "You would need a lot more of an intensive programme (…) to change your emotional eating because it goes back so far. (…) [A more intensive programme would] look at the emotions about how you were feeling (…) when you were younger"*
>
> P7 (female, 24y, EE 83.3)

Other suggestions for more intensive and *"in-depth"* (P5, female, 50y, EE 72.2) support included *"some new sessions"* (P14, female, 35y, EE 72.2) that they could try, being more *"flexible"* (P5, female, 50y, EE 72.2), and providing personalised features. For example, being able to choose to do the emotional eating sessions sooner within the programme, or being able to obtain more support with emotional eating by being signposted to further readings and information.

4. Discussion

In this study, we explored participants' experiences of emotional eating during an ACT-based weight loss maintenance programme in order to understand how these interventions influence emotional eating and to generate new hypotheses on how addressing emotional eating in WMIs can be improved. We developed five themes in our reflexive thematic analysis. We concluded that the SWiM program helped participants to improve their management of emotional eating by improving self-awareness (Theme 1) and by providing alternative coping strategies (Theme 2). Successful implementation of strategies meant that the SWiM programme was used less regularly over time and adaptions, including more time-sensitive support, may be required for efficient ongoing use (Theme 3). Whether participants were able to engage with the intervention content depended on the level of control they perceived to have in response to external triggers of emotion (Theme 4), and how useful the emotional eating content was perceived to be depended on participants' prior experience of emotional eating (Theme 5).

Our analysis suggests that increased self-awareness helped participants to reduce the automaticity and habitual nature of emotional eating and to decouple the experience of the emotion and the behavioural

response (Theme 1). These conclusions resemble two of the six core components of ACT theory, supporting their role as key mechanisms of action by which SWiM supported emotional eating (1) 'self as context' (i.e. observing the thinking and feeling self to disconnect from unpleasant experiences): and (2) 'present moment awareness' (i.e. living in the present instead of the past or future, as the present is the time where action can be taken) (Hayes, 2004; Hayes et al., 2006). Specifically, we concluded that important aspects of self-awareness were an improved ability to identify and describe feelings (decreased alexithymia), and an increased sense of internal bodily states (increased interoception). Aligning with this interpretation, previous studies have observed an association between lower interoceptive awareness or higher alexithymia and higher levels of emotional eating (Ahlich & Rancourt, 2022; Bullock & Goldbacher, 2021; McAtamney et al., 2021, 2023; Robinson et al., 2021; Willem et al., 2021; Young et al., 2017) and found that emotional eating partially mediated the association between interoception or alexythymia and BMI (Pink et al., 2019; Robinson et al., 2021). Additionally, a systematic review and meta-analysis concluded that mindfulness-based interventions, which conceptually share the ACT components of 'self as context' and 'present moment awareness' with ACT, were effective at reducing alexythymia (Norman et al., 2019). Our analysis also agrees with that of a qualitative study exploring processes of change during a mindfulness-based intervention for emotional eating (Beccia et al., 2020). This study characterised self-awareness as the first step to improve emotional eating, with self-awareness including the recognition of triggers and increasing awareness of bodily signals, leading to a de-automatisation of emotional eating. Thus, self-awareness seems to be an important factor involved in breaking the emotional eating cycle and may facilitate the implementation of alternative coping strategies.

Our analysis further describes that participants used a combination of alternative coping strategies to manage emotional eating, including preparation, substitution, and acceptance (Theme 2). Preparation and substitution strategies resemble the ACT component of 'committed action', whereby participants developed patterns of action consistent with their values, such as preparing for the risk of emotional eating by not bringing typical emotional eating foods in the house and planning for ways to substitute emotional eating. This also overlaps with traditional behaviour change methods, such as goal setting and reshaping the environment. Participants' reports of acceptance strategies are similar to the ACT components of 'cognitive diffusion' and 'acceptance', since they involve non-judgemental acceptance of uncomfortable thoughts and feelings without trying to change them (i.e. acceptance) while only changing the way they are interacted with (i.e. cognitive diffusion) (Hayes, 2004; Hayes et al., 2006). ACT theory proposes that its components work together to reduce experiential avoidance (i.e. the tendency to avoid uncomfortable feelings and sensations) and increase psychological flexibility (i.e. the ability to stay in the present moment, observing emotions and sensations without aiming to change them). This is in line with our analysis, where participants reported using acceptance strategies to let themselves feel emotions without acting on them. Similarly, previous studies have observed that emotional eating is associated with both experiential avoidance (Litwin et al., 2017) and psychological flexibility (Sairanen et al., 2015). However, a recent systematic review performing a meta-regression did not find that changes in psychological flexibility were associated with changes in dysregulated eating outcomes (Di Sante et al., 2022). Meta-regressions are at risk of ecological bias, which occurs if information is pooled on the study-level as opposed to the individual level (Riley et al., 2021). Hence, findings should be interpreted with caution. Further research has shown that changes in experiential avoidance and weight-related psychological flexibility mediate the impact of ACT-based interventions on outcomes related to emotional eating (Lillis et al., 2011; Sairanen et al., 2017). As such, our analysis supports ACT theory and previous literature in suggesting that reducing experiential avoidance and increased psychological flexibility may be driving factors for ACT-based interventions in improving emotional eating.

In our third theme, we highlighted that some participants who found SWiM helpful implemented long-term habits to manage their emotional eating, but they wished for more opportunities to re-engage with the intervention, particularly in challenging moments (Theme 3). Research has explored the delivery of targeted micro-interventions, called 'just-in-time' adaptive interventions (JITAIs), at moments of risk (e.g., when a participant is experiencing an emotional eating trigger) with the help of artificial intelligence and wearable devices. For example, Forman et al., 2019 found that the addition of their JITAIs to standard Weight Watchers treatment increased its effectiveness on weight loss outcomes. However, our analysis describes that the timing that support may be needed may differ from when the emotion is acutely experienced. For example, when having an emotional experience during the day, emotional eating might be at risk of occurring only once coming home in the evening, or even at the weekend. Thus, an intervention might be most appropriate at a later time after the acute experience of emotion. More research is needed to understand when participants require intervention support and how lasting changes in emotional eating can best be achieved through different forms of continued engagement. Additionally, studies with longer follow-ups are required to enhance our understanding of the impact of interventions on emotional eating over time.

Participants who struggled to engage with the intervention often displayed signs of an external locus of control (LOC), meaning that they felt they had little or no power or control over the circumstances affecting them (Theme 4). While people with an internal LOC perceive outcomes in their life to result from their own actions, people with an external LOC see their life being determined by external factors, such as chance, fate or luck and, thus, feel they do not have the ability to influence their future. Evidence points towards to associations between an external LOC with obesity (Neymotin & Nemzer, 2014). Additionally, while research on its link to emotional eating specifically is lacking, an external LOC was found to mediate the association between stress and eating (Qi & Cui, 2019). This is in line with the theoretical underpinnings of the LOC which hypothesises that individuals with a more internal LOC are more likely to engage in adaptive responses when faced with barriers to health (Neymotin & Nemzer, 2014). Thus, an external LOC might have presented a barrier to effectively engage in SWiM. A brief report of a behavioural intervention for binge eating had similar findings; Kamody et al., 2021 found that a more internal LOC was associated with better intervention completion and a greater reduction in emotional eating. Despite its conceptual overlap with the ACT components 'self as context', 'acceptance' and 'committed action', limited research has examined the role of an external LOC in ACT-based treatments. More research is needed to understand how to better support participants with an external LOC with their management of emotional eating in ACT-based WMIs. Qualitative research exploring barriers related to the experience of both an external LOC and emotional eating in an ACT-based weight management context may be particularly suited to address this.

Our analysis also describes how participants' perception of the usefulness of the intervention content differed based on their previous experiences of emotional eating. For example, participants describing a more 'complex' experience of emotional eating found the SWiM content to be insufficient to address their emotional eating needs (Theme 5). This 'complex' experience could reflect a variety of potentially correlated factors, such as emotional eating severity, type of emotional eating and any underlying mental health problems, such as depression and trauma. An enhanced understanding of these factors and how they impact treatment may be important for future interventions. For example, Hermes et al., 2021 found that recent experiences of trauma were associated with maladaptive coping mechanisms, including emotional eating. This suggests that for those individuals that experienced trauma, emotional eating may develop as a response and may be addressed in combination with trauma treatment. Additionally, Braden

et al., 2018 compared associations of eating in response to depression, anxiety or boredom with disordered eating and emotion regulation difficulties. They found that eating in response to depression was most strongly associated with global psychological well-being, eating disorder symptoms and emotion regulation. This suggests that participants who eat in response to emotions related to depression might require greater support with emotion regulation than those eating in response to other emotions. This is in line with accumulating evidence reporting associations of emotional eating with depression and suggesting that emotional eating is an important factor in the pathway that links depression and weight gain (Konttinen, 2020; Konttinen et al., 2019; Lazarevich et al., 2016; van Strien et al., 2016). We may conclude that participants experience different forms of emotional eating, potentially requiring different types of treatment.

Research exploring whether treatment efficacy depends on the complexity of participants' experience of emotional eating is limited. Forman et al., 2013 examined whether the effectiveness of ACT-based WMIs depended on levels of emotional eating and suggested that the intervention was more effective for those with higher emotional eating. However, they compared dichotomized groups of people with low vs high levels of emotional eating. This limits insights into whether the intervention might work well for people with mild to moderate emotional eating levels, but could be insufficient for participants with more complex emotional eating. It is important to also consider that receiving an intervention that does not match personal needs could have negative effects, since the lack of sufficient support could exacerbate participants' negative feelings and ultimately worsen their emotional eating. Future studies should investigate how to best support participants with complex experiences of emotional eating and consider whether treatment may be more effective when personalised based on individual emotional eating needs.

4.1. Methodological considerations

This study provides insights into participants' experiences of emotional eating during an ACT-based WMI that can inform future interventions wishing to address emotional eating. Several methodological decisions may have shaped our analysis.

Firstly, we interviewed participants six months after starting the intervention. This allowed for insights into participants use of the intervention over time, as well as into their subjective memory of the intervention content. However, as time had passed, things other than SWiM could have influenced participants' weight management journey. For example, some participants joined additional weight management programmes. This is common in weight management trials and may stem from an increased motivation to pursue weight loss. Since the topic of the interview for this study was the SWiM intervention, we can assume that participants at least in part attributed any reported changes to the SWiM intervention.

We selected participants from the main trial to cover a range of emotional eating levels, allowing us to explore a variety of experiences, and we used the information power principle to inform the number of participants deemed appropriate to address our research objectives. While some research suggest studies of varied experiences generally require greater sample sizes, we opted for a broad exploratory overview of emotional eating experiences for this study (Hennink & Kaiser, 2022). Future research may wish to target a narrower range of experiences, such as focussing on 'complex' experiences of emotional eating, to explore them in greater depth. We also aimed to purposefully select participants with varied demographic backgrounds. However, reflective of the main trial, we recruited and interviewed mainly white, female participants. Previous research has found significant differences in emotional eating scores between men and women (Guerrero-Hreins et al., 2022), and there might be cultural and ethnic differences in how emotional eating is experienced (Luomala et al., 2009; Thompson & Romeo, 2015). As such, our analysis might be less transferable to men or people from different cultural and ethnic backgrounds participating in ACT-based WMIs. Future research may wish to explore sex differences in the experience of emotional eating, as well as differences in experiences across cultural contexts.

Although participants with a current eating disorder diagnosis were excluded, this does not account for the potential presence of undiagnosed eating disorders. Previous research has identified a link between emotional eating and binge eating (Reichenberger et al., 2021). Since the presence of undiagnosed eating disorders, such as binge eating, may impact how participants experience emotional eating, future research may wish to screen for eating disorders by asking participants to complete an eating disorder assessment.

Since body weight and emotional eating can be sensitive and emotionally charged topics, we created a safe environment to share information by highlighting the confidentiality of the interview, emphasising that there are no right or wrong answers, and by showing compassion and support during the interview. We also reminded them of the voluntary nature of the interview and offered to skip questions or end the interview early if desired.

Lastly, we used reflexive thematic analysis to explore participants' experiences. This allowed us to draw upon our background and experience when generating themes. To enhance the depth of analysis, we included the perspective of lived experience in the analysis; we worked closely with two PPIE members as co-authors on this study. We documented our thoughts and feelings and how we interacted with the data in a journal to keep a record of the reflexive process.

4.2. Conclusion

This ACT-based intervention supported participants in their management of emotional eating by encouraging self-reflection regarding their experience of emotions and internal bodily states. Improved self-awareness helped participants to de-couple emotions from the automated behavioural response of eating and engage in alternative coping mechanisms instead. These included prevention, substitution, and acceptance strategies that resemble the core components of ACT theory. Participants' suggestions for improvement included more opportunities to re-engage with the intervention content over time, particularly in moments of challenge where participants feel at risk of engaging in emotional eating. Participants who did not find the intervention helpful often displayed an external LOC and exhibited more complex forms of emotional eating. Future research may explore how to better support people with an external LOC and complex experiences of emotional eating. Additionally, future research could consider how best to tailor treatment to personal needs with regard to emotional eating.

Funding

LK, RAJ, SJG and ALA are funded by the Medical Research Council MC_UU_00006/6. The SWiM trial was funded by the National Institute for Health Research (NIHR) under its Programme Grants for Applied Research Programme (RP–PG–0216–20010). The views expressed are those of the authors and not necessarily those of the NIHR or the Department of Health and Social Care. The funders did not have any involvement in the study.

Ethical statement

This qualitative study was embedded in the feasibility evaluation of the SWiM (Supporting Weight Management) trial (Ahern et al., 2022). The trial was preregistered (ISRCTN12107048) and ethical approval was obtained from the Cambridge Psychology Research Ethics Committee (Application No: PRE.2020.049) on 24/04/2020.

CRediT authorship contribution statement

Laura Kudlek: Conceptualization, Data curation, Formal analysis, Methodology, Resources, Writing – original draft. **Rebecca A. Jones:** Formal analysis, Methodology, Resources, Supervision, Writing – review & editing. **Carly Hughes:** Formal analysis, Methodology, Writing – review & editing. **Robbie Duschinsky:** Formal analysis, Methodology, Supervision, Writing – review & editing. **Andrew Hill:** Methodology, Resources, Writing – review & editing. **Rebecca Richards:** Methodology, Resources, Writing – review & editing. **Megan Thompson:** Formal analysis, Writing – review & editing. **Ann Vincent:** Formal analysis, Writing – review & editing. **Simon J. Griffin:** Methodology, Writing – review & editing. **Amy L. Ahern:** Conceptualization, Formal analysis, Methodology, Resources, Supervision, Writing – review & editing.

Declaration of competing interest

CH has received honoraria for educational work around Obesity, unrelated to this research from Novo Nordisk, and Ethicon. SG has received honoraria from Astra Zeneca for speaking at postgraduate education meetings for primary care teams. AA is a member of the WW Scientific Advisory Board, for which payment is made to her institution, and is the Principal Investigator of two publicly funded trials where the intervention was provided by WW at no cost. AJH receives payment for advice to Slimming World (UK). Other authors do not report any conflicts of interest.

Data availability

Data will be made available on request.

Acknowledgements

We would like to thank all SWiM investigators and study coordinators for developing and delivering the SWiM intervention (including Fiona Whittle, Jenny Woolston, Stephen J. Sharp, Emma R. Lawlor, Stephen Morris, Francesco Fusco, Alan Brennan, Jennifer Bostock and Julia Mueller). We would also like to thank Michelle Chester for supporting participant selection. We would also like to thank Gillian Pountain for piloting the interview schedule before commencing data generation. We also thank Obesity Voice Hub, particularly Suneet Morley, for their support in recruiting patient representatives. Finally, we would like to thank all of our participants for taking part in the interviews. Without them, this research would not have been possible.

Appendix A. Supplementary data

Supplementary data to this article can be found online at https://doi.org/10.1016/j.appet.2023.107138.

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