

**“Trying to make healthy choices”: the challenges of the food reintroduction phase of the NHS Low Calorie Diet Programme pilot for type 2 diabetes**

HOMER, Catherine <<http://orcid.org/0000-0003-2571-6008>>, KINSELLA, Karina, BROWN, Tamara, MARWOOD, Jordan, DREW, Kevin, RADLEY, Duncan, FREEMAN, Charlotte, OJO, Abimbola, TEKE, Jennifer, CLARE, Ken, BAKHAI, Chirag and ELLS, Louisa

Available from Sheffield Hallam University Research Archive (SHURA) at:  
<https://shura.shu.ac.uk/33697/>

---

This document is the Published Version [VoR]

**Citation:**

HOMER, Catherine, KINSELLA, Karina, BROWN, Tamara, MARWOOD, Jordan, DREW, Kevin, RADLEY, Duncan, FREEMAN, Charlotte, OJO, Abimbola, TEKE, Jennifer, CLARE, Ken, BAKHAI, Chirag and ELLS, Louisa (2024). “Trying to make healthy choices”: the challenges of the food reintroduction phase of the NHS Low Calorie Diet Programme pilot for type 2 diabetes. *British Journal of Diabetes*. [Article]

---

**Copyright and re-use policy**

See <http://shura.shu.ac.uk/information.html>

# “Trying to make healthy choices”: the challenges of the food reintroduction phase of the NHS Low Calorie Diet Programme pilot for type 2 diabetes

CATHERINE HOMER,<sup>1</sup> KARINA KINSELLA,<sup>2</sup> TAMARA BROWN,<sup>2</sup> JORDAN MARWOOD,<sup>2</sup> KEVIN JAMES DREW,<sup>2</sup> DUNCAN RADLEY,<sup>3</sup> CHARLOTTE FREEMAN,<sup>2\*</sup> ABIMBOLA OJO,<sup>4</sup> JENNIFER TEKE,<sup>4</sup> KEN CLARE,<sup>2</sup> CHIRAG BAKHAI,<sup>5</sup> LOUISA ELLS<sup>2</sup>

## Abstract

**Background:** The food reintroduction phase of the NHS Low Calorie Diet (LCD) programme aims to support service users to reintroduce food gradually back into their diet. Understanding experiences of food reintroduction from a broad and diverse range of service users is critical in helping to improve service delivery and commissioning and equity in care.

**Methods:** This was a co-produced qualitative study underpinned by a realist informed approach, using interviews and photovoice techniques. Service users (n=43) of the NHS LCD Programme were recruited from three delivery models across 21 pilot sites in England. Data were analysed using a thematic approach.

**Results:** The food introduction phase required control and planning that challenged the behaviours of participants. Around a third of participants continued use of Total Diet Replacement products, or considered doing so, for convenience and to maintain calorie control. The coach–service user relationship was important to understanding of session content and translation into behaviour change. Physical activity increased during this phase, which contributed to positive health outcomes.

**Conclusions:** The paper reports insights from the food reintroduction phase of the LCD programme. Key messages

include the need for increased frequency of support and the need for tailored and culturally representative education.

*Br J Diabetes* 2024;24:ONLINE AHEAD OF PUBLICATION  
<https://doi.org/10.15277/bjd.2024.436>

**Key words:** food reintroduction, type 2 diabetes, obesity, Low Calorie Diet, qualitative, longitudinal, Re:Mission study

## Introduction

This is the second of three linked papers that follow the journey of service users through the NHS Low Calorie Diet (LCD) Programme.<sup>1</sup> This paper focuses on service users' experiences reported at 18 weeks, which is the end of Food Reintroduction (FR), the second phase of the programme. Full programme details are reported in Homer *et al.*<sup>2</sup>

The FR phase of the LCD programme aims to support service users to gradually re-introduce food back into their diet using a stepped approach.<sup>1</sup> During this phase, service users reduce the number of daily Total Diet Replacement (TDR) products from four to zero over the course of four to six weeks, whilst introducing healthy meals into their diet and attending fortnightly behaviour change support sessions. The NHS England LCD programme service specification<sup>3</sup> states that by the end of FR, service users should no longer be using TDR products, and should be consuming a nutritionally balanced diet that is appropriate for their individual nutrition needs, preferences and traditions. In contrast to the TDR phase, in which additional physical activity is not actively encouraged, service users in the FR phase are supported through goal-setting and educational resources to be physically active to achieve their weight maintenance goals, as recommended by NICE guidance. Understanding service user experiences helps to understand what works (and what doesn't), for whom and why. These insights are critical in informing the development of equitable service delivery and commissioning.

## Methods

This article details the methodological approach undertaken using the COREQ guidelines, see supplementary file 1 – online at [www.bjd-abcd.com](http://www.bjd-abcd.com)

<sup>1</sup> Sport and Physical Activity Research Centre, Sheffield Hallam University, Olympic Legacy Park, Sheffield

<sup>2</sup> Obesity Institute, School of Health, Leeds Beckett University, City Campus, Leeds

<sup>3</sup> Obesity Institute, School of Sport, Leeds Beckett University, Headingley Campus, Leeds

<sup>4</sup> Re:Mission Patient and Public Involvement Group, Obesity Institute, School of Health, Leeds Beckett University, Leeds

<sup>5</sup> Larkside Practice, Churchfield Medical Centre, Luton, Bedfordshire

\* Current address of author CF is Calderdale Metropolitan Borough Council, Halifax, UK

**Address for correspondence:** Dr Catherine Homer  
Sport and Physical Activity Research Centre, Sheffield Hallam University, Olympic Legacy Park, 2 Old Hall Road, Sheffield, S9 3TU  
E-mail: [c.homer@shu.ac.uk](mailto:c.homer@shu.ac.uk)  
<https://orcid.org/0000-0003-2571-6008>

Longitudinal interviews and photo elicitation were conducted with a sample of 28 participants from the original 30 interviewed at 12 weeks.<sup>1</sup> The two participants not interviewed withdrew from the study for personal reasons. The experiences of service users who withdrew from the programme are reported elsewhere.<sup>4</sup> Eighteen people also participated in photovoice data collection methods as described by Homer *et al.*<sup>2</sup> Interviews were conducted and recorded online using Microsoft Teams and lasted between 38 and 90 minutes. Two researchers (KD, CH) conducted the interviews, with six interviews also supported by members of the Re:Mission patient and public involvement team.

Interviews were transcribed verbatim and analysed thematically.<sup>5</sup> KK led the initial coding of the 18-week interviews deductively and inductively using the 12-week thematic analysis

framework. Additional codes from the 18-week data were added to the framework. CH cross-checked a sample of transcripts and, following discussion between KK and CH, a final thematic framework was developed and used to undertake the final coding. Data were stored and organised using NVivo Software (QS International Play Ltd. Version 12.6).

Data from cross-sectional interviews (n=15) interviews conducted with participants at six months into the LCD programme (see references 1 and 2 for more information) relating to participant experience of the FR phase were also included in this analysis. These interviews aimed to expand the diversity of experiences by collecting data from population groups or delivery models that were not well represented in the longitudinal interviews.

**Table 1.** Participant characteristics at 18-week interviews

Characteristics		Longitudinal participants (n=28)	Cross-sectional participants (n=15)	Total number of participants (n=43)
Gender	Male	11 (40%)	6 (40%)	17 (40%)
	Female	17 (60%)	9 (60%)	26 (60%)
Age (years)	30-34	1 (4%)	0 (0%)	1 (2%)
	35-39	3 (11%)	2 (13%)	5 (12%)
	40-44	3 (11%)	2 (13%)	5 (12%)
	45-49	3 (11%)	2 (13%)	5 (12%)
	50-54	6 (21%)	2 (13%)	8 (18%)
	55-59	4 (14%)	3 (20%)	7 (16%)
	60-65	8 (28%)	4 (27%)	12 (28%)
Service provider	SP1	1 (4%)	1 (7%)	2 (5%)
	SP2	18 (64%)	5 (33%)	23 (53%)
	SP3	7 (25%)	3 (20%)	10 (23%)
	SP4	1 (4%)	4 (27%)	5 (12%)
	SP5	1 (4%)	2 (13%)	3 (7%)
Delivery model	Face-to-Face 1:1	1 (4%)	2 (13%)	3 (7%)
	Remote 1:1	2 (7%)	4 (27%)	6 (14%)
	Remote Group	22 (78%)	6 (40%)	28 (65%)
	Digital	3 (11%)	3 (20%)	6 (14%)
Ethnic group*	White British or White Mixed British	23 (82%)	10 (66%)	33 (77%)
	Asian/Asian British	3 (11%)	0 (0%)	3 (7%)
	Black/African/Caribbean/Black British	1 (4%)	2 (13%)	3 (7%)
	Mixed or Multiple Ethnic Group	1 (4%)	1 (7%)	2 (5%)
	Other Ethnic Group	0 (0%)	1 (7%)	1 (2%)
	Prefer not to say	0 (0%)	1 (7%)	1 (2%)
IMD quintiles <sup>§</sup>	1 (most deprived)	11 (39%)	2 (13%)	13 (32%)
	2	4 (14%)	3 (20%)	7 (16%)
	3	5 (18%)	3 (20%)	8 (18%)
	4	3 (11%)	4 (27%)	7 (16%)
	5 (least deprived)	5 (18%)	3 (20%)	8 (18%)

\* The ethnic group classification as used by the Office for National Statistics in the 2021 census

<sup>§</sup> The Index of Multiple Deprivation (IMD) score is an absolute measure of deprivation that allows for Lower Super Output Areas (LSOAs) in England to be ranked and subsequently classified into five quintile bands. Quintile 1 is the 20% most deprived LSOAs in England, while quintile 5 is the 20% least deprived LSOAs.



Ethical approval was received from the Health Research Authority (REF 21/WM/0126) and Leeds Beckett University (REF 107887 and 79441).

Results

Participant demographics across the longitudinal and cross-sectional interviews were representative of the overall LCD programme, according to interim data presented to the advisory group in summer of 2023. Participant characteristics are shown in Table 1 and supplementary file 2 (online at [www.bjd-abcd.com](http://www.bjd-abcd.com)).

Five core themes were derived from the findings: 1) navigating challenges and embracing enablers in the FR stage; 2) continued use of TDR; 3) the importance of clear person-centred session content; 4) the need for provider support; and 5) the benefits of physical activity.

Navigating challenges and embracing enablers in the FR stage (Table 2)

Participants reported the practical, physical, social and emotional aspects of FR. Practical challenges included changes in food shopping routines and responsibilities for home cooking and meal planning. Physical changes include changes to bowel habits, including reliance on medications to manage constipation. Whilst participants were looking forward to going out to socialise and eat with others (as this was restricted during the TDR phase), they discussed the challenges of making healthy food choices from limited menus or having to influence

the choice of place based on finding something they could eat. They also reported how the TDR phase gave structure to their energy intake and provided a sense of control from not having to make food choices. This control was later challenged by needing to reintroduce food, with some participants feeling that TDR was easier to manage than healthy eating. Many participants reported feeling empowered and more mindful regarding healthy food choices, although some described anxiety about the possibility of returning to previous unhealthy habits and difficulties with portion control.

Participants were encouraged to reach and sustain weight loss targets during the programme. However, some had not met these targets by the end of the TDR phase and were seeking further weight loss, while others were aiming to sustain a particular weight goal as they transitioned during this FR phase. Apprehension regarding weight regain was commonly discussed.

Continued use of TDR (Table 3)

By the end of the FR phase, 15 (35%) of the 43 participants (nine females and six males aged 40–65) were either actively using TDR products or expressed an intention to continue doing so. The reasons for participants’ continued use of TDR included convenience and its effectiveness in helping them stick to their dietary routines. It also served as a compensatory measure in instances where they had eaten foods perceived as unhealthy. Some participants had identified other LCD brands they could purchase privately; this was not always discussed with their coach. Several participants articulated their intention to use

Table 2. Theme one - Navigating challenges and embracing enablers in the FR stage - quotes	
Sub theme	Illustrative quote
Lack of structure, challenges of planning, preparing meals, and cooking	<i>"Week 2, two shakes two meals, I'm struggling. I am really finding it hard to go back to food, trying to make healthy choices, eating stuff that I probably shouldn't be eating or eating more than I should be. Knowing that I've got to control my portion sizes but because I'm eating food it seems easy to lapse and part of me's just like oh my God give me back the shakes, it's just so hard."</i> (P18)
Physical, social and emotional impact during food reintroduction	<i>"My one big issue is my constipation. I'm just not regularly going to the toilet. I mean, I don't think I've been for about six days now properly, and that's a niggle and a worry. And I did go to a doctor and they did give me something for it and it doesn't seem to be working. Some tablets that supposed to soften your stools and make you a bit more regular, but it's not working. So I'm worried about that. So that's at the back of my head."</i> (P82)  <i>"There are challenges, particularly when you go out. If you go out with friends, the temp, it's not really a temptation because I've got a good mindset now I think, I look at everything, and it's really helped me because a lot of meals now when you go out have got the calorie content on the menu there. So you can choose it and think I'll go for the healthier option. But it's difficult sometimes if you go out to a nice restaurant and either the calories are not on the menu there or they're very rich meals, you know rich, or think it's fish and chips or it's going to be some big, you know some lasagne or something like that so you think well that's gonna be bad, but you get used to it really."</i> (P114)
Concerns about returning to previous habits	<i>"Initially I started to have small amounts and then one thing led to another. I went back to my old habits of eating. So over the last five weeks, I really have struggled to find a routine that I enjoy cooking or the food that I like. It's, yeah the food that I enjoy is the wrong type of food and I've not got to. That change, my mindset it's not right yet. I'm struggling."</i> (P28)
Emotional challenges and anxiety about food reintroduction	<i>"I was eating a lot in one go, and I think that is wrong. And I think for me is I have to have breakfast, I have to have lunch but keep within the limits. And mentally I think I wasn't ready for or prepared enough for food reintroduction. And what [coach] said is actually quite, yeah, because before I don't have to think about food, I was secure, safe, I had my shakes and I was losing weight. But then suddenly oh, I have to do this and get plans and sort myself out. I think I wasn't prepared for it mentally."</i> (P125)
Fear of weight gain	<i>"My weight is creeping up since I came off the full liquid part of it and introducing food. I'm not controlling it properly and I don't want to, because if I'm controlling it properly, where's the pleasure in life? But I hate not having that control. And I mean, I had, I said 85 kilogram was my target, I wanted it to be 80 to 83. I touched 83. I'm sitting at 85, 86 at the moment, which is I feel a failure at the moment, I need to get it down another two."</i> (P82)  <i>"I think it's that kind of fear that oh I've lost all this weight and now I'm gonna put it all back on 'cause I'm gonna start eating again. So that was really supportive to have someone you know sort of every week reminding you that it was OK and you're doing alright."</i> (P70)

**Table 3.** Theme two - Continued use of TDR – quotes

Sub theme	Illustrative quote
TDR use for convenience and structure	<i>"I still wasn't comfortable with the introducing the food and it, to be honest, I'm still eating a couple of TDR products in the day and I'll just have a main meal. Some days I'll have more than one meal, but they're trying to encourage me to completely move away from TDR but I haven't." (P7)</i>
TDR use to support weight loss or disordered use of products	<i>"And then there are other supplements you know, available as well. Other food replacement supplements too that are available. But yeah, typically to compensate if I feel that I've eaten too many sweet things or too many starchy things and I haven't really been able to do as much activity or exercise I'd like to do, then I would incorporate that." (P43)</i> <i>"So now again, now and again I will have that as a replacement meal. It's very much sort of a dynamic situation because it really depends if I feel I've eaten too many starchy and sweet things and that I need to cut back." (P43)</i>
TDR use to combat hunger	<i>"But shakes yeah definitely is something that I'll continue with because I've found them so good and so sort of like appetising that they, they have well personally for me they have took the hunger pangs away, yeah." (P54)</i>
Awareness of the reset package and lack of intention to use TDR products	<i>"I was grateful. I didn't think to do that but when they called I said yeah, you know what, I'm going to try again and maybe I need a little bit more support. And to go back on the reset was quite good because I get my head in the right state, you know, in the right way of thinking and thinking about the mistakes I've done. Thinking what, what I can do better next time and that give me the time to, to reflect, you know, the past, the future and yeah, it was a god sent thing." (P125)</i>

TDR products as a fallback mechanism in instances where they experienced sensations of hunger. Additionally, some participants reported using TDR products as a mechanism to aid future weight loss if they hadn't hit their intended target, or to manage any future weight regain. This has been implicitly reinforced by the programme including the offer of four weeks of 'rescue' TDR (termed by some providers as 'reset') if there was weight regain of more than 2kg during the weight maintenance phase.

**The importance of clear person-centred session content**  
(Table 4)

Across all delivery models, the sessions included a structured programme of content, intended to be delivered using a person-centred approach and to provide relevant information and behaviour change support at key points. During the FR

interviews, participants reflected on the information they had received to support them with the FR phase and what was missing. Some, but not all, providers offered tailored dietary information for cultural food practices and support for managing FR during religious festivals (such as Ramadan). The interview data also suggested varying support to address emotional eating.

Participant understanding of session content varied. For some people the level of explanation regarding food types and macronutrients was sufficient, whereas others reported that they didn't understand the content delivered during sessions or provided in the additional resources, and therefore struggled to implement this knowledge into their life. Participants who were in the group delivery model reported that they had insufficient opportunity to ask questions and were sometimes unable to speak to their coach to check understanding outside

**Table 4.** Theme three - The importance of clear person-centred session content – quotes

Sub theme	Illustrative quote
Accessibility of information	<i>"It was all a bit technical. So there was a lot of protein. How many, how much protein should I have? And I'm like literally like I ain't got a blooming clue, you know. And I know I probably should have learned it somewhere along the way, but I felt oh God, I should know this, I don't. You know, and I panicked a little bit. And then I thought, you know what, I don't know it. I don't know, you know. So maybe it was a bit too, I don't know, scientific. Maybe that's yeah that's maybe the word. It needed to sort of be a little bit less. I mean the scientific stuff I couldn't, I don't care, you know, just tell me what I can and can't have or what the sorry, the government or the health people advise you to have. Don't make it all scientific, 4 grams of this, you know, like I'm trying to work out this week how many grams of protein based on what weight and I don't care you know. So that I sort of switch off a bit after, when it gets a bit boring and a bit scientific I switch off. I don't remember much conversation about food, to be honest." (P18)</i> <i>"There is something that I'm gonna be bringing up in the next session when the regular mentor is there because you know all of us in the group have different conditions, have different disabilities, have different mental health issues or mental health conditions. And we have struggled and some have struggled really badly and others but we've been supportive to each other. And I just wanna, I'm gonna raise it up in the next session to see whether they can develop a better mental health toolkit. I suppose just taking somebody off the programme, they can function if they were given the correct tools. So there's a case of, you know, devising a mental health toolkit that can be implemented within this programme. And I think that'd be better, most beneficial for next programmes that they, that follow on from us." (P15)</i>
Cultural acceptability and adoptions	<i>"I think overall it's better than anticipated. I think that there's, there's scope to for it to be developed better and to be delivered in such a way that more alternatives can be put in for, obviously because of different cultural and religious backgrounds, there is a section for those that are on Ramadan. There's also a section for those that are fasting, et cetera like that. So that kind of support on this reintroduction of food is there and it is accessible and it is in our recipe books. And there's also on online programme documents etc. So that's been good because it's it covers everybody from one culture to another and one eating habits to another and one food intake to another." (P15)</i>



**Table 5.** Theme four - The need for provider support – quotes

Sub theme	Illustrative quote
Views about the duration of session delivery	<i>"The sessions was suitable, but it's six weeks of that phase two and I only had sessions with the provider every two weeks. I think it could have benefited from having them once a week because, obviously you know you're reintroducing food some will have more issues than that, but that's why we have WhatsApp group. But I think I personally think it should have been a weekly thing." (P15)</i>
Access to additional support, such as contact outside of scheduled sessions	<i>"And when you get the call centre, when you talk to the call centre people, yeah I'd have more luck talking to Santa sometimes I think. Because they are really 'cause they really just read off a script. There's no, there's no real clinical training for them. Whereas a little bit of clinical training, they'd probably be able to deal with half the phone calls that come." (P56)</i> <i>"It all kind of fell apart, in part from, you know, the, the coach wasn't responding, the app wasn't responding. They made out, you know, I kind of felt abandoned and they made out afterwards, a long time afterwards, that it was some technical issue, but it really you know, other people said there were no technical issues and so I think it was just like kind of human gap." (P71)</i>
Attributes of the coach, including skills, person-centeredness and delivery style	<i>"I mean I will say for [coach] she's not done, she's been the best one out of any of them. And I think she's, she's, I think she's worked her magic with all of us. She's always cheerful. You know you can have a laugh with her...I think she's learned a lot about us through us doing the sessions. She knows whether we've had a bad week or good week by what we've told her with the measurements." (P36)</i>

of the allocated group session. The one-to-one delivery model was more conducive to answering service user questions and responding to individual need. It was evident that some participants wanted more guidance and support with meal preparation and structured meal plans.

**The need for provider support** (Table 5)

Service users emphasised that the FR phase required the highest level of support from providers, and some perceived fortnightly sessions to be insufficiently frequent. Many stated that more frequent sessions would have helped them to feel more prepared to reintroduce food and provide more regular touchpoints to ask questions and receive support.

Participants noted that having the same coach delivering the sessions was integral to developing the coach-service user relationship, and sessions tended to be less effective when conducted by a replacement coach. The person-centredness demonstrated by some coaches was welcomed and participants talked about the relationship they had built with their coach. This appeared to be down to the individual coach rather than provider or delivery model.

Across all delivery models, out of session support was highlighted as an area for improvement. Participants talked about a lack of person-centredness, digital Apps not working, inadequate responses to emails or messages from the call

centre, and helplines not consistently staffed by individuals with adequate training. This resulted in communication breakdown or delays in responding in a timely manner, resulting in some participants feeling abandoned outside the sessions.

**The benefits of physical activity** (Table 6)

During FR, service users were encouraged to set physical activity goals as part of their behaviour changes to support ongoing weight and blood glucose management. This was a new element of the programme, as additional physical activity (above routine activities) was not actively encouraged during the TDR phase. During FR some providers required service users to set challenges of steps per day, which was reported back as part of the routine monitoring. Most participants reported a notable increase in the amount and type of exercise they were doing. Many reported incorporating additional physical activity into their routines, ranging from regular family activities, commuting, using home-based gym equipment or taking up exercise on referral gym or swim passes (where available).

The self-reported benefits of increased physical activity included feelings of increased energy, improved mobility, functional fitness and improved mental wellbeing. Several participants noted that weight loss boosted their confidence in taking up new activities such as dance or Zumba. This in turn led to positive experiences in day-to-day life, such as being able

**Table 6.** Theme five - The benefits of physical activity – quotes

Sub theme	Illustrative quote
Increased exercise and physical activity	<i>"I am putting a lot of effort into it now. First thing I do in the morning I'll make breakfast for my husband and then I'll go for a walk. And I have a walk. I used to do about 3 to 4000 steps before I started this. Now do up to nearly 10 to 20,000 steps a day." (P35)</i>
Intentions to undertake more exercise in the future	<i>"I'm thinking, really thinking of joining £20 a month no contract, access to swimming pool, sauna and beautiful gym. And they do hydro aerobics or aqua aerobics every week so it just sounds right up my street. And I can terminate at any time without having incurring any charges so every Monday I'm going for this programme, rehabilitation programme. So I'm definitely gonna register, become a member next week. I have no, I have never joined a gym in my life, ever. That's a massive change for me." (P57)</i>
Improvements to day-to-day living/ functioning	<i>"I didn't take the picture of the steps down to it, you have to go down a massive hill down a boatload of steps to get down to it. Walk across the river and go down a load more steps. It is, it's a killer. It's an amazing place to go but I would never have done that a year ago. I'd have got to the top of that hill and I'd have said to [husband] you go and walk, sod that rot. But I was straight down. (P58)</i> <i>"I just feel so much better in myself... I've always loved swimming, but for me, in the late last few years with being overweight, on holiday I've always got a sun bed near the pool. Why? Because I don't want to have to walk half a mile to the pool where people can see. But I didn't care this time." (P50)</i>

to manage self-care, visiting new places or fulfilling hobbies such as going to football matches. Participants who had not yet increased their activity levels still expressed intention to be more active in the future. Some participants highlighted barriers to increased physical activity such as sedentary jobs, cold weather deterring outdoor activities or a lack of awareness of local opportunities.

## Discussion

This is the first paper outlining the experience of service users as they completed the FR phase of the 52-week NHS LCD programme, delivered across broad and diverse populations. The interviews highlighted the practical, social and emotional aspects of FR, including excitement about eating real foods, as well as anxiety around choice and portion control. The control of energy intake and the limited choice experienced during TDR was often found easier to manage than making healthy food choices, a finding also reported in the DiRECT study,<sup>6</sup> although some participants reported feeling newly empowered and mindful regarding eating habits. The interviews also highlighted a need for support with emotional eating behaviours, as identified in the interviews at 12 weeks,<sup>1</sup> and other reports showing high prevalence of emotional eating in participants.<sup>7</sup>

Not all participants had met their weight loss goals by the time of FR and some were therefore seeking additional weight loss, with a proportion continuing to use TDR products or planning to do so to manage weight and offset unhealthy dietary choices. This is consistent with the findings of interviews at the end of the TDR phase of the programme. The DiRECT study, upon which the NHS LCD programme is largely based, permitted those in the intervention group to extend the use of TDR to beyond 12 weeks. Rehackova and colleagues reported that this allowed users to reach their own weight loss goals,<sup>6</sup> increased self-satisfaction and the likelihood of longer-term weight loss maintenance.<sup>8,9</sup>

The availability of person-centred support outside session times was highlighted as a particular area for improvement by some participants. Additionally, participants reported a need for more guidance and support with meal preparation and structured meal plans,<sup>10</sup> as well as a desire for more frequent support sessions during FR. Session content and delivery should be adapted according to health literacy,<sup>11</sup> and should consistently be tailored to cultural needs.<sup>12</sup> The attributes of the coach and their relationship with service users is important in supporting this process.<sup>13</sup> Group sessions impacted on the time and opportunity to develop these relationships, a finding that was also seen in the observations of session delivery.<sup>14</sup> This was also reflected in the new programme specification (now called the NHS Type 2 Diabetes Path to Remission Programme) which provides only one-to-one in-person or digital delivery,<sup>12</sup> thus enhancing the opportunity for person-centred and tailored support.

Physical activity increased during the FR phase, as service users were motivated, more physically able following weight loss, and encouraged to be more active.<sup>15</sup> If maintained, this activity increase has been shown to support longer-term weight



## Key messages

- ▲ Participants identified a clear need for increased frequency of person-centred support, particularly regarding emotional eating behaviours and support outside of scheduled session times.
- ▲ There is a demand for more guidance and support with meal preparation and planning. Tailored and culturally representative education is also essential to address diverse needs effectively.
- ▲ The one-to-one delivery model is found to be more effective in addressing service user questions and individual needs. This model highlights the importance of personalised interaction and responsiveness.

loss,<sup>16,17</sup> and to improve physical and psychological health.<sup>17-19</sup> Barriers to participating in physical activity included limited awareness of local opportunities, which has been previously reported and can be further heightened in underserved populations.<sup>20,21</sup> This could be addressed by service providers working more collaboratively with local organisations to enhance awareness of opportunities.<sup>22</sup>

## Strengths and limitations

This paper presents participant experiences from the FR phase of the NHS LCD programme pilot and highlights areas for service improvements. Representation was strengthened by the addition of reflections from the cross-sectional data. As this paper presents outcomes at 18 weeks into a 52-week programme, the outcomes experienced at this point may not be reflective of outcomes reported at the end of the programme. A limitation of the data reported in this paper was the low number of participants from diverse ethnic groups and as such an understanding of the impact of ethnicity on dietary choices in the FR stage. The experience of 12 South Asian participants from the LCD programme is reported by Dhir *et al.*<sup>12</sup>

## Recommendations for policy and practice

1. Commissioners and providers should consider increasing the regularity of the support available during the FR phase.
2. Consideration should be given to strengthening person-centred support available outside session times.
3. Coaches should be further trained regarding cultural competency and appropriately tailored resources and materials should be developed.
4. Providers should avoid assuming health literacy and should tailor content according to need. One-to-one delivery may allow for better coach understanding of service users' individual requirements.
5. Providers should ensure awareness of local physical activity opportunities.



## Conclusions

The paper provides unique insights into service user experiences during food reintroduction. It highlights common feelings about departing from the structure and control provided by TDR and having to manage new food choices. It also demonstrates the importance of person-centred support to support long-term behaviour changes.



© 2024. This work is openly licensed via CC BY 4.0.

This license enables reusers to distribute, remix, adapt, and build upon the material in any medium or format, so long as attribution is given to the creator. The license allows for commercial use. CC BY includes the following elements: BY – credit must be given to the creator.

**Copyright ownership** The author(s) retain copyright.

**Conflict of interest** The authors declared the following potential conflicts of interest with respect to the research, authorship and/or publication of this article: LE has received funding from NIHR, MRC, Leeds City Council and OHID/PHE in the last three years and has had an honorary contract with OHID. CB is a primary care adviser to the national diabetes programme for NHS England. KC is the Chair of Trustees Patient Charity WLSinfo, Chair of Trustees ECPO, Membership Patient Advisory Board Boehringer Ingelheim and sits on the Advisory Board for Eli Lilly.

**Funding** This work was supported by the National Institute for Health Research, Health Services and Delivery Research [NIHR 132075]. The NHS LCD programme is funded by NHS England. For the purpose of open access, the author has applied a Creative Commons Attribution (CC BY) licence to any author accepted manuscript version arising. The views expressed in this publication are those of the author(s) and not necessarily those of the MRC, NIHR or the Department of Health and Social Care.

**Acknowledgements** The authors would like to acknowledge Clare Helm from NHS England, who has worked on the coproduction of this study, identification of study aims and who provided feedback on an earlier draft of this manuscript.

The authors would also like to acknowledge the Patient and Public Involvement team that have worked on the coproduction of the Re:Mission study, including Mike Willis, Gulsoom Akhtar, Beth Clegg and Clair Goddard. Members of the steering and oversight groups are also acknowledged by the authors for their input and involvement in the Re:Mission study, including the clinical lead Dr Mark Ashton.

The Re:Mission study includes a multidisciplinary team of academics from across the North of England. The authors would like to acknowledge the team, including Dr Jamie Matu, Prof Jim McKenna, Dr Maria Maynard, Pat Watson, Dr Susan Jones, Dr Simon Rowlands, Dr Tanefa Apekey, Dr Stuart Flint, Prof Janet Cade, Dr Adam Martin, Dr Maria Bryant, Dr Wendy Burton, Mick Martson, Pooja Dhir and Tamla Evans.

**Ethical approval** Ethical approval was received from the Health Research Authority (REF 21/WMM/0126) and Leeds Beckett University (REF 107887 and 79441). Participants provided informed consent to participate in the Re:Mission study, including consent for publication. All participant data were anonymised and where photos have been used in publications or presentations, permission was sought from each participant.

## References

- Homer C, Kinsella K, Drew KJ, *et al.* A fresh start with high hopes: A qualitative evaluation of experiences of the Total Diet Replacement phase of the NHS Low Calorie Diet Programme pilot. *Br J Diabetes* 2024;**24**:ONLINE AHEAD OF PUBLICATION. <https://doi.org/10.15277/bjd.2024.435>
- Homer C, Kinsella K, Marwood J, *et al.* The Re:Mission study: Evaluating the NHS Low Calorie Diet pilot - an overview of service user data collection. *Br J Diabetes* 2024;**24**:ONLINE AHEAD OF PUBLICATION. <https://doi.org/10.15277/bjd.2024.433>
- England N. NHS Low Calorie Diet Programme – face to face [one to one/group] delivery model - Service Specification. 2019.
- Drew KJ, Homer C, Radley D, Bakhai C, Ellis L. A qualitative study of the experiences of individuals who did not complete the NHS Low Calorie Diet Programme Pilot. *Br J Diabetes* 2024;**24**:ONLINE AHEAD OF PUBLICATION. <https://doi.org/10.15277/bjd.2024.434>
- Braun V, Clarke V, Weate P. Using thematic analysis in sport and exercise research. Routledge handbook of qualitative research in sport and exercise 2016 pp191-205.
- Rehackova L, Rodrigues AM, Thom G, *et al.* Participant experiences in the Diabetes REmission Clinical Trial (DiRECT). *Diabetic Medicine* 2022;**39**(1):e14689. <https://doi.org/10.1111/dme.14689>
- Marwood J, Radley D, Evans TS, *et al.* Cross-sectional analysis of emotional and binge eating in UK adults enrolled on the NHS Low-Calorie Diet Pilot for Type 2 Diabetes (under review); 2023
- Elfagh K, Rössner S. Who succeeds in maintaining weight loss? A conceptual review of factors associated with weight loss maintenance and weight regain. *Obesity Reviews* 2005;**6**(1):67-85. <https://doi.org/10.1111/j.1467-789X.2005.00170.X>
- Byrne S, Cooper Z, Fairburn C. Weight maintenance and relapse in obesity: a qualitative study. *Internat Journal Obesity Relat Metab Disord* 2003;**27**(8):955-62. <https://doi.org/10.1038/sj.ijo.0902305>
- Cunningham C, Johnson S, Cowell B, *et al.* Menu plans in a diabetes self-management weight loss program. *Journal Nutrition Education Behav* 2006;**38**(4):264-6. <https://doi.org/10.1016/j.jneb.2006.01.013>
- Faruqi N, Spooner C, Joshi C, *et al.* Primary health care-level interventions targeting health literacy and their effect on weight loss: a systematic review. *BMC Obesity* 2015;**2**(1):1-16. <https://doi.org/10.1186/s40608-015-0035-7>
- Dhir P, Maynard M, Drew KJ, Homer C, Bakhai C, Ellis L. South Asian individuals' experiences on the NHS low calorie diet programme: a qualitative study in community settings in England. *BMJ Open* 2023;**13**(12):e079939. <https://doi.org/10.1136/bmjopen-2023-079939>. <https://pubmed.ncbi.nlm.nih.gov/38154908/>
- Muñoz Obino KF, Aguiar Pereira C, Caron-Lienert RS. Coaching and barriers to weight loss: an integrative review. *Diabetes Metabolic Syndrome Obesity* 2017;**10**:1-11. <https://doi.org/10.2147/DMSO.S113874>
- Marwood J, Kinsella K, Homer C, *et al.* Is the NHS low-calorie diet programme delivered as planned? An observational study examining adherence of intervention delivery to service specification. *Clinical Obesity* 2024;**e12652**. <https://doi.org/10.1111/cob.12652>
- Kruger J, Blanck HM, Gillespie C. Dietary and physical activity behaviors among adults successful at weight loss maintenance. *Internat Journal Behavioral Nutrition Physical Activity* 2006;**3**(1):1-10. <https://doi.org/10.1186/1479-5868-3-17>
- Catenacci VA, Wyatt HR. The role of physical activity in producing and maintaining weight loss. *Nature Clinical Practice Endocrinol Metab* 2007;**3**(7):518-29. <https://doi.org/10.1038/ncpendmet0554>
- Swift DL, Johannsen NM, Lavie CJ, Earnest CP, Church TS. The role of exercise and physical activity in weight loss and maintenance. *Progress Cardiovascular Dis* 2014;**56**(4):441-7. <https://doi.org/10.1016/j.pcad.2013.09.012>
- Posadzki P, Pieper D, Bajpai R, *et al.* Exercise/physical activity and health outcomes: an overview of Cochrane systematic reviews. *BMC Public Health* 2020;**20**:1-12. <https://doi.org/10.1186/s12889-020-09855-3>
- Biddle SJ, Fox K, Boutcher S. Physical activity and psychological well-being: Routledge; 2003.
- Lidegaard L, Schwennesen N, Willaing I, Færch K. Barriers to and motivators for physical activity among people with type 2 diabetes: patients' perspectives. *Diabetic Medicine* 2016;**33**(12):1677-85. <https://doi.org/10.1111/dme.13167>
- Bantham A, Ross SET, Sebastião E, Hall G. Overcoming barriers to physical activity in underserved populations. *Progress Cardiovasc Dis* 2021;**64**:64-71. <https://doi.org/10.1016/j.pcad.2020.11.002>
- Rutter H, Cavill N, Bauman A, Bull F. Systems approaches to global and national physical activity plans. *Bulletin World Health Organization* 2019;**97**(2):162. <https://doi.org/10.2471/BLT.18.220533>



**Supplementary file 1:** Consolidated criteria for reporting qualitative studies (COREQ): 32-item checklist

No. item	Guide questions/description	Reported on page #
<b>Domain 1: research team and reflexivity</b>		
<i>Personal characteristics</i>		
1. Interviewer/facilitator	Which author/s conducted the interview or focus group?	p3
2. Credentials	What were the researcher's credentials? E.g. PhD, MD	Additional File 1
3. Occupation	What was their occupation at the time of the study?	Additional File 1
4. Gender	Was the researcher male or female?	Additional File 1
5. Experience and training	What experience or training did the researcher have?	Additional File 1
<i>Relationship with participants</i>		
6. Relationship established	Was a relationship established prior to study commencement?	Reported in Homer C <i>et al.</i> The Re:Mission study: Evaluating the NHS Low Calorie Diet pilot - an overview of service user data collection. <i>British Journal of Diabetes</i> , In review. <sup>2</sup>
7. Participant knowledge of the interviewer	What did the participants know about the researcher? e.g. personal goals, reasons for doing the research	Reported in Homer C <i>et al.</i> The Re:Mission study: Evaluating the NHS Low Calorie Diet pilot - an overview of service user data collection. <i>British Journal of Diabetes</i> , In review. <sup>2</sup>
8. Interviewer characteristics	What characteristics were reported about the interviewer/facilitator? e.g. Bias, assumptions, reasons and interests in the research topic	n/a
<b>Domain 2: study design</b>		
<i>Theoretical framework</i>		

9. Methodological orientation and theory	What methodological orientation was stated to underpin the study? e.g. grounded theory, discourse analysis, ethnography, phenomenology, content analysis	Reported in Homer C <i>et al.</i> The Re:Mission study: Evaluating the NHS Low Calorie Diet pilot - an overview of service user data collection. <i>British Journal of Diabetes</i> , In review. <sup>2</sup>
<i>Participant selection</i>		
10. Sampling	How were participants selected? e.g. purposive, convenience, consecutive, snowball	Reported in Homer C <i>et al.</i> The Re:Mission study: Evaluating the NHS Low Calorie Diet pilot - an overview of service user data collection. <i>British Journal of Diabetes</i> , In review. <sup>2</sup>
11. Method of approach	How were participants approached? e.g. face-to-face, telephone, mail, email	Reported in Homer C <i>et al.</i> The Re:Mission study: Evaluating the NHS Low Calorie Diet pilot - an overview of service user data collection. <i>British Journal of Diabetes</i> , In review. <sup>2</sup>
12. Sample size	How many participants were in the study?	p4
13. Non-participation	How many people refused to participate or dropped out? Reasons?	p4
<i>Setting</i>		
14. Setting of data collection	Where were the data collected? e.g. home, clinic, workplace	p4
15. Presence of non-participants	Was anyone else present besides the participants and researchers?	p4
16. Description of sample	What are the important characteristics of the sample? e.g. demographic data, date	pp.4 and 5 and additional file 2.
<i>Data collection</i>		
17. Interview guide	Were questions, prompts, guides provided by the authors? Was it pilot tested?	Reported in Homer C <i>et al.</i> The Re:Mission study: Evaluating the NHS Low Calorie Diet



		pilot - an overview of service user data collection. <i>British Journal of Diabetes</i> , In review. <sup>2</sup>
18. Repeat interviews	Were repeat interviews carried out? If yes, how many?	n/a
19. Audio/visual recording	Did the research use audio or visual recording to collect the data?	p3
20. Field notes	Were field notes made during and/or after the interview or focus group?	n/a
21. Duration	What was the duration of the interviews or focus group?	p3
22. Data saturation	Was data saturation discussed?	n/a
23. Transcripts returned	Were transcripts returned to participants for comment and/or correction?	n/a
<b>Domain 3: analysis and findings</b>		
<i>Data analysis</i>		
24. Number of data coders	How many data coders coded the data?	p4
25. Description of the coding tree	Did authors provide a description of the coding tree?	pp. 4-13
26. Derivation of themes	Were themes identified in advance or derived from the data?	p4
27. Software	What software, if applicable, was used to manage the data?	p4
28. Participant checking	Did participants provide feedback on the findings?	n/a
<i>Reporting</i>		
29. Quotations presented	Were participant quotations presented to illustrate the themes/findings? Was each quotation identified? e.g. participant number	pp.7-12
30. Data and findings consistent	Was there consistency between the data presented and the findings?	pp.5-13
31. Clarity of major themes	Were major themes clearly presented in the findings?	pp.5-13
32. Clarity of minor themes	Is there a description of diverse cases or discussion of minor themes?	pp.5-13

Developed from:

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. Volume 19, Number 6: pp. 349 – 357

**Personal characteristics of researchers:**

Dr Catherine Homer PhD (Female). Associate Professor of Obesity and Public Health with experience working in academia and extensive experience working in public health.

Karina Kinsella MRes (Female). Research Officer for the Re:Mission Study with extensive experience of evaluating interventions.

Dr Tamara Brown PhD (Female). Reader in Obesity, with 5 years' experience of focus groups and research in weight management.

Dr Jordan Marwood PhD (Female). Research Fellow with extensive experience conducting obesity research, with particular focus on disordered and emotional eating.

Dr Kevin J Drew PhD (Male). Post-doctoral Research Fellow with 7 years' experience of conducting qualitative evaluations of health-based interventions.

Dr Duncan Radley PhD (Male). Reader with 25 years' experience conducting obesity research, and previously research manager in weight management service providers.

Charlotte Freeman (Female). Project research officer with experience of evaluating interventions in academia and primary care services as well as experience of working in public health.

Dr Abimbola Ojo PhD (Female). Member of the Patient and Public Engagement team for Re:Mission and Local Authority Public Health Specialist.

Dr Jennifer Teke (PhD) (Female). Member of the Patient and Public Engagement team for Re:Mission and Hospital Trust Research Manager.

Ken Clare (Male). Patient and Public Engagement Lead. Director of Bariatric and Metabolic Surgery Support at a national patient advocacy charity.

Dr Chirag Bakhai (Male). General Practitioner, Clinical Lead on the Re:Mission Study Oversight group and Primary Care Advisor to the NHS Diabetes Programme.



Dr Louisa Ells (Female). Professor of Obesity with a specialist interest in multi-disciplinary, cross-sector applied obesity research, with extensive experience of leading programme evaluations.

Supplementary file 2: Participant demographics

Table 1: 18-week participant demographics (n=28)

Participant *1	Age (years)	Gender	Ethnic group <sup>2</sup>	Provider	Delivery model	IMD quintiles <sup>3</sup>	Participated in photo elicitation
P7	50-54	Female	White British or white Mixed British	SP3	Group	5	N
P9	60-65	Male	White British or white Mixed British	SP3	Group	1	Y
P15	45-49	Male	White British or white Mixed British	SP3	Group	3	Y
P16	50-54	Male	White British or white Mixed British	SP3	Group	1	Y
P17	50-54	Female	White British or white Mixed British	SP3	Group	1	Y
P18	50-54	Female	White British or white Mixed British	SP2	1-to-1	5	Y
P19	55-59	Female	Any other Black background	SP3	Group	1	N
P21*	30-34	Female	White British or white Mixed British	SP2	Group	1	N
P28	45-49	Male	Asian or Asian British	SP5	1-to-1 Face-to-Face	4	N
P34	60-65	Male	White British or white Mixed British	SP2	Group	1	Y
P35	60-65	Female	Asian or Asian British	SP2	Group	1	Y
P36	40-44	Female	White British or white Mixed British	SP2	Group	3	N
P40*	60-65	Male	White British or white Mixed British	SP2	Group	3	Y
P43*	45-49	Female	Mixed or Multiple Ethnic Group	SP2	Group	2	Y
P45	40-44	Male	White British or white Mixed British	SP2	Group	1	N
P48	35-39	Female	White British or white Mixed British	SP2	Group	5	Y
P50	60-65	Female	White British or white Mixed British	SP2	Group	5	Y
P51	60-65	Male	White British or white Mixed British	SP2	Group	2	N
P54	60-65	Male	White British or white Mixed British	SP2	Digital	1	Y
P56	35-39	Female	White British or white Mixed British	SP2	Group	1	N
P57*	55-59	Female	White British or white Mixed British	SP2	Group	3	Y
P58	50-54	Female	White British or white Mixed British	SP2	Group	2	Y
P65	35-39	Female	Any other white background	SP3	Group	1	Y
P66*	55-59	Female	White British or white Mixed British	SP2	Group Face-to-Face	4	Y
P70*	50-54	Female	White British or white Mixed British	SP4	Digital	5	Y
P71	55-59	Male	Asian or Asian British	SP2	Digital	4	N
P76	40-44	Female	White British or white Mixed British	SP1	1-to-1	2	Y
P82	60-65	Male	White British or white Mixed British	SP2	Group	3	N

1 \*Interviews supported by members of the Re:Mission patient and public involvement team.

2 The ethnic group classification as used by the Office for National Statistics in the 2021 census

3 The Index of Multiple Deprivation (IMD) score is an absolute measure of deprivation that allows for Lower Super Output Areas (LSOAs) in England to be ranked and subsequently classified into five quintile bands. Quintile 1 is the 20% most deprived LSOAs in England, while quintile 5 is the 20% least deprived LSOAs.



Supplementary file 2: Participant demographics continued

Table 2: Cross-sectional- Participant demographics (n=15)

Participant	Age (years)	Gender	Ethnic group <sup>2</sup>	Provider	Delivery model	IMD quintiles <sup>3</sup>
P4	50-54	Male	White British or white Mixed British	SP4	Digital	4
P5	40-44	Female	White British or white Mixed British	SP5	1-to-1 Face-to-Face	2
P84	35-39	Male	White British or white Mixed British	SP5	1-to-1	3
P85	35-39	Female	White British or white Mixed British	SP3	Group	1
P87	60-65	Male	White British or white Mixed British	SP3	Group	5
P88	55-59	Female	White British or white Mixed British	SP1	1-to-1	3
P91	66-70	Female	Black/African/Caribbean/Black British	SP2	Group	2
P96	50-54	Male	Black/African/Caribbean/Black British	SP4	Group	1
P114	55-59	Female	White British or white Mixed British	SP2	1-to-1	3
P125	60-65	Female	White British or white Mixed British	SP2	Group	5
P129	55-59	Male	White British or white Mixed British	SP4	Digital	4
P133	45-49	Female	Prefer not to say	SP2	1-to-1 Face-to-Face	4
P142	60-65	Male	Mixed or Multiple Ethnic Group	SP2	1-to-1	5
P144	45-49	Female	Other ethnic group	SP3	Group	4
P156	40-44	Female	White British or white Mixed British	SP4	Digital	2