

SUPPLEMENTARY MATERIAL

Table S1. Description of the HEAL-D intervention components to support each BCT identified.

<i>BCT</i>	<i>Intervention component</i>
Social support (unspecified)	Social connectedness is fostered within the group by the discursive nature of the sessions and through shared engagement in activities and structured exercise sessions.
Social comparison	The <i>'task card'</i> homework activities give participants the opportunity to try the lifestyle targets and come back to discuss with the group and with educators. Participants are encouraged to share their successes to encourage comparison within the group. In addition, role models are featured in case study videos.
Credible sources	Videos are used as part of the intervention including advice and tips from community leaders, healthcare practitioners and patients from the community that have successfully changed their habits.
Information about health consequences	The educational curriculum covers health consequences and benefits of various key lifestyle behaviours. Participants receive a pack including written information and activities to support each educational session. An animation video " <i>Diabetes explained</i> " explains the mechanisms of type 2 diabetes.
Feedback on outcomes, self-monitoring of behaviour	The programme starts with personal measurements and blood results, and updated outcome measures are given at the end of the programme. Participants are encouraged to monitor weight loss progress by taking waist measurements through the course and completing their programme booklets.
Self-monitoring of behaviour, action planning	Participants are given pedometers to measure their steps and are taught to develop action plans and measure their progress against them.
Instruction on how to perform the behaviour	The curriculum communicates health guidance clearly using culturally relevant examples.
Demonstration	Practical games, the weekly discussion tasks, a cooking session (with Black-British cooks) and structured exercise sessions (including African dance music and dancing) provide guided demonstration. An exercise DVD using credible sources is provided for participants to use at home.
Graded tasks	Physical activity sessions and targets are graded for ability to boost chances of success hence confidence and self-efficacy.
Goal setting (behaviour)	Participants are guided through setting their own goals for the lifestyle targets that are important for them.
Problem solving	The <i>'task card'</i> homework activities are discussed at the beginning of each session, challenges are identified and the group problem-solve collectively. Problem-solving also forms part of the education sessions about lifestyle habits.
Action planning	Participants are guided through how to develop and adjust action plans for each of the target behaviours and for their personal objectives, to help keep them motivated.

Table S2: Trial retention rates (95% CI limits presented as subscripts *lower* and *upper*)

	Retention, n (lower % upper)
Overall (n=55)	51 (82 93 98)
Study group	
<i>Intervention (n=27)</i>	25 (76 93 99)
<i>Control (n=28)</i>	26 (76 93 99)
Sex	
<i>Male (n=17)</i>	15 (64 88 99)
<i>Female (n=38)</i>	36 (82 95 99)
Ethnicity	
<i>African* (n=27)</i>	24 (71 89 98)
<i>Caribbean (n=28)</i>	27 (82 96 100)
Age group	
<55 (n=19)	17 (67 89 99)
55-64 (n=20)	19 (75 95 100)
≥65 (n=16)	15 (70 94 100)
Employment status	
<i>Employed/self-employed (n=21)</i>	18 (64 86 97)
<i>Unpaid work** (n=5)</i>	5 (48 100 100)
<i>Unemployed (n=10)</i>	10 (69 100 100)
<i>Retired (n=19)</i>	18 (74 95 100)
Generational status***	
<i>First generation (n=40)</i>	37 (80 93 98)
<i>Second generation (n=13)</i>	12 (64 92 100)

Retention calculated as the number of participants who attended the endpoint visit as a percentage of those recruited. * includes one participant who was Mixed White and Black African; ** *unpaid work* includes volunteering, student and house wife/husband; *** generational status was missing for two participants.

Table S3: Number of sessions (max of seven) attended by participants in the intervention group

	Attendance				
	Mean (SD)	95% CI for mean	Median	IQR	Range
Overall (n=27)	5.7 (1.7)	5.1-6.4	6	5-7	1-7
Sex					
<i>Male (n=9)</i>	5.6 (1.1)	4.7-6.4	6	5-6	3-7
<i>Female (n=18)</i>	5.8 (1.9)	4.9-6.8	7	6-7	1-7
Ethnicity					
<i>African* (n=11)</i>	6.0 (1.3)	5.2-6.8	6	5-7	3-7
<i>Caribbean (n=16)</i>	5.6 (1.9)	4.6-6.6	6	5.5-7	1-7
Age group					
<55 (n=10)	5.3 (2.2)	3.8-6.8	6	3-7	1-7
55-64 (n=8)	5.6 (1.7)	4.2-7.0	6	5-7	2-7
≥65 (n=9)	6.3 (0.7)	5.8-6.9	6	6-7	5-7
Employment status					
<i>Paid/self-employed (n=11)</i>	5.2 (2.2)	3.7-6.6	6	3-7	1-7
<i>Other** (n=16)</i>	6.1 (1.1)	5.5-6.7	6	6-7	3-7
Generational status***					
<i>First generation (n=21)</i>	5.7 (1.7)	4.9-6.4	6	5.5-7	1-7
<i>Second generation (n=5)</i>	6.0 (1.7)	-	7	6-7	3-7

* includes one participant who was Mixed White and Black African; ** *other* includes voluntary, unemployed, student, house wife/husband and retired; *** generational status was missing for one participant, and not presented in this subgroup analysis due to small intervention group sizes.

Table S4. Data completion rates of clinical outcomes

	Variable, n (lower % upper)									
	<i>HbA1c</i>	<i>Waist circumference</i>	<i>Weight</i>	<i>BMI</i>	<i>SBP</i>	<i>DBP</i>	<i>Total cholesterol</i>	<i>HDL</i>	<i>LDL</i>	<i>Triglycerides</i>
Overall (n=55)	51 (82 93 98)	50 (80 91 97)	51 (82 93 98)	51 (82 93 98)	50 (80 91 97)	50 (80 91 97)	51 (82 93 98)	51 (82 93 98)	51 (82 93 98)	51 (82 93 98)
Study group										
<i>Intervention (n=27)</i>	25 (76 93 99)	25 (76 93 99)	25 (76 93 99)	25 (76 93 99)	24 (71 89 98)	24 (71 89 98)	25 (76 93 99)	25 (76 93 99)	25 (76 93 99)	25 (76 93 99)
<i>Control (n=28)</i>	26 (76 93 99)	25 (72 89 98)	26 (76 93 99)	26 (76 93 99)	26 (76 93 99)	26 (76 93 99)	26 (76 93 99)	26 (76 93 99)	26 (76 93 99)	26 (76 93 99)
Sex										
<i>Male (n=17)</i>	15 (64 88 99)	14 (57 82 96)	15 (64 88 99)	15 (64 88 99)	15 (64 88 99)	15 (64 88 99)	15 (64 88 99)	15 (64 88 99)	15 (64 88 99)	15 (64 88 99)
<i>Female (n=38)</i>	36 (82 95 99)	36 (82 95 99)	36 (82 95 99)	36 (82 95 99)	35 (79 92 98)	35 (79 92 98)	36 (82 95 99)	36 (82 95 99)	36 (82 95 99)	36 (82 95 99)
Ethnicity										
<i>African* (n=27)</i>	24 (71 89 98)	23 (66 85 96)	24 (71 89 98)	24 (71 89 98)	23 (66 85 96)	23 (66 85 96)	24 (71 89 98)	24 (71 89 98)	24 (71 89 98)	24 (71 89 98)
<i>Caribbean (n=28)</i>	27 (82 96 100)	27 (82 96 100)	27 (82 96 100)	27 (82 96 100)	27 (82 96 100)	27 (82 96 100)	27 (82 96 100)	27 (82 96 100)	27 (82 96 100)	27 (82 96 100)
Age group										
<i><55 (n=19)</i>	17 (67 89 99)	17 (67 89 99)	17 (67 89 99)	17 (67 89 99)	16 (60 84 97)	16 (60 84 97)	17 (67 89 99)	17 (67 89 99)	17 (67 89 99)	17 (67 89 99)
<i>55-64 (n=20)</i>	19 (75 95 100)	19 (75 95 100)	19 (75 95 100)	19 (75 95 100)	19 (75 95 100)	19 (75 95 100)	19 (75 95 100)	19 (75 95 100)	19 (75 95 100)	19 (75 95 100)
<i>≥65 (n=16)</i>	15 (70 94 100)	14 (62 88 98)	15 (70 94 100)	15 (70 94 100)	15 (70 94 100)	15 (70 94 100)	15 (70 94 100)	15 (70 94 100)	15 (70 94 100)	15 (70 94 100)
Employment status										
<i>Paid/self-employed (n=21)</i>	18 (64 86 97)	18 (64 86 97)	18 (64 86 97)	18 (64 86 97)	17 (58 81 95)	17 (58 81 95)	18 (64 86 97)	18 (64 86 97)	18 (64 86 97)	18 (64 86 97)
<i>Unpaid work** (n=5)</i>	5 (48 100 100)	5 (48 100 100)	5 (48 100 100)	5 (48 100 100)	5 (48 100 100)	5 (48 100 100)	5 (48 100 100)	5 (48 100 100)	5 (48 100 100)	5 (48 100 100)
<i>Unemployed (n=10)</i>	10 (69 100 100)	10 (69 100 100)	10 (69 100 100)	10 (69 100 100)	10 (69 100 100)	10 (69 100 100)	10 (69 100 100)	10 (69 100 100)	10 (69 100 100)	10 (69 100 100)
<i>Retired (n=19)</i>	18 (74 95 100)	17 (67 89 99)	18 (74 95 100)	18 (74 95 100)	18 (74 95 100)	18 (74 95 100)	18 (74 95 100)	18 (74 95 100)	18 (74 95 100)	18 (74 95 100)
Generational status***										
<i>First generation (n=40)</i>	37 (80 93 98)	36 (76 90 97)	37 (80 93 98)	37 (80 93 98)	36 (76 90 97)	36 (76 90 97)	37 (80 93 98)	37 (80 93 98)	37 (80 93 98)	37 (80 93 98)
<i>Second generation (n=13)</i>	12 (64 92 100)	12 (64 92 100)	12 (64 92 100)	12 (64 92 100)	12 (64 92 100)	12 (64 92 100)	12 (64 92 100)	12 (64 92 100)	12 (64 92 100)	12 (64 92 100)

Rates calculated as the number of participants who had both baseline and endpoint data as a percentage of those recruited (95% CI limits presented as subscripts *lower* and *upper*)

* includes one participant who was Mixed White and Black African; ** *unpaid work* includes volunteering, student and house wife/husband; *** generational status was missing for two participants

Table S5. Data completion rates of patient reported outcomes

	Variable, n (lower % upper)						
	<i>Diabetes knowledge</i>	<i>Dietary competence</i>	<i>Empowerment</i>	<i>Quality of life</i>	<i>Diabetes distress</i>	<i>Social support</i>	<i>Physical activity</i>
Overall (n=55)	49 (78 89 96)	49 (78 89 96)	47 (73 85 94)	50 (80 91 97)	50 (80 91 97)	49 (78 89 96)	48 (76 87 95)
Study group							
<i>Intervention (n=27)</i>	24 (71 89 98)	23 (66 85 96)	23 (66 85 96)	24 (71 89 98)	24 (71 89 98)	24 (71 89 98)	23 (66 85 96)
<i>Control (n=28)</i>	25 (72 89 98)	26 (76 93 99)	24 (67 86 96)	26 (76 93 99)	26 (76 93 99)	25 (72 89 98)	25 (72 89 98)
Sex							
<i>Male (n=17)</i>	14 (57 82 96)	14 (57 82 96)	14 (57 82 96)	14 (57 82 96)	14 (57 82 96)	14 (57 82 96)	14 (57 82 96)
<i>Female (n=38)</i>	35 (79 92 98)	35 (79 92 98)	33 (72 87 96)	36 (82 95 99)	36 (82 95 99)	35 (79 92 98)	34 (75 89 97)
Ethnicity							
<i>African* (n=27)</i>	23 (66 85 96)	23 (66 85 96)	22 (62 81 94)	23 (66 85 96)	23 (66 85 96)	23 (66 85 96)	22 (62 81 94)
<i>Caribbean (n=28)</i>	26 (76 93 99)	26 (76 93 99)	25 (72 89 98)	27 (82 96 100)	27 (82 96 100)	26 (76 93 99)	26 (76 93 99)
Age group							
<i><55 (n=19)</i>	17 (67 89 99)	17 (67 89 99)	16 (60 84 97)	17 (67 89 99)	17 (67 89 99)	17 (67 89 99)	16 (60 84 97)
<i>55-64 (n=20)</i>	17 (62 85 97)	18 (68 90 99)	16 (56 80 94)	18 (68 90 99)	18 (68 90 99)	17 (62 85 97)	17 (62 85 97)
<i>≥65 (n=16)</i>	15 (70 94 100)	14 (62 88 98)	15 (70 94 100)	15 (70 94 100)	15 (70 94 100)	15 (70 94 100)	15 (70 94 100)
Employment status							
<i>Paid/self-employed (n=21)</i>	17 (58 81 95)	17 (58 81 95)	16 (53 76 92)	17 (58 81 95)	17 (58 81 95)	17 (58 81 95)	16 (53 76 92)
<i>Unpaid work** (n=5)</i>	5 (48 100 100)	5 (48 100 100)	5 (48 100 100)	5 (48 100 100)	5 (48 100 100)	5 (48 100 100)	5 (48 100 100)
<i>Unemployed (n=10)</i>	9 (55 90 100)	10 (69 100 100)	8 (44 80 97)	10 (69 100 100)	10 (69 100 100)	9 (55 90 100)	9 (55 90 100)
<i>Retired (n=19)</i>	18 (74 95 100)	17 (67 89 99)	18 (74 95 100)	18 (74 95 100)	18 (74 95 100)	18 (74 95 100)	18 (74 95 100)
Generational status***							
<i>First generation (n=40)</i>	36 (76 90 97)	36 (76 90 97)	34 (70 85 94)	37 (80 93 98)	37 (80 93 98)	36 (76 90 97)	36 (76 90 97)
<i>Second generation (n=13)</i>	11 (55 85 98)	11 (55 85 98)	11 (55 85 98)	11 (55 85 98)	11 (55 85 98)	11 (55 85 98)	10 (46 77 95)

Rates calculated as the number of participants who had both baseline and endpoint data as a percentage of those recruited (95% CI limits presented as subscripts *lower* and *upper*).

* includes one participant who was Mixed White and Black African; ** *unpaid work* includes volunteering, student and house wife/husband; *** generational status was missing for two participants Measurement tools for patient reported outcomes: *Quality of life*, EuroQol EQ5D-3L visual analogue scale; *Diabetes distress*, using the 5-item Problem Areas In Diabetes

(PAID-5) scale; *Diabetes knowledge*, using the Short Diabetes Knowledge Instrument (SDKI); *Empowerment*, using the Diabetes Empowerment Scale Short Form (DES-SF); *Dietary competence*, using the Perceived Diabetes & Dietary Competence measure (PDDC); and *Social support*, using the Multidimensional Scale of Perceived Social Support (PSS).

Table S6. Evaluation of intervention fidelity and acceptability – findings and illustrative quotes from patients and educators

Intervention component	Summary of findings	Illustrative quotes
FORMAT		
Frequency of sessions	There was no clear consensus as to whether the programme should be weekly or fortnightly though the majority of participants and educators leaned to the latter.	<p><i>“The one week, they felt rushed. They felt with all their day-to-day and everyday stuff and having to sort out...The two-week lot felt more relaxed, and you could see it.... The one thing I remember they'd say, they had the time to practice [with 2 weeks]”</i> Group 3/4 - Lay educator</p> <p><i>“Every two weeks when you've just started a programme can be tough because, by week two, they've already forgotten what we talked about in week one. I think, maybe, weekly to start off with and then break off into bi-weekly would be a better way forward.”</i> Group 5 - Lay educator</p>
Dose	The number of hours and sessions was generally perceived as about right. Several participants wanted more than seven sessions because of the enjoyment they felt in taking part rather than the need for these sessions per se.	<p><i>“If it can continue [after 7 weeks], even if it's not twice a month or every four weeks, it would be lovely.”</i> Focus group 3 - patients</p> <p><i>“I think this works probably better in terms of people really taking it in, the two hours every second week or even weekly, but will people stick with it?..... It's that balance, isn't it, whether in reality people are able to commit to come back for seven weeks.”</i> Group 3 - Lead educator</p>
Flexibility - when and where	Flexibility in when and where to attend was appreciated by participants for sometimes unexpected reasons such as enabling them to determine their preferred educator. However, group sizes were variable as a result which could cause issues. In the largest groups it was hard for everyone to be heard but the smallest comprised only two people and so lacked in the social cohesion behavioural change techniques built into the design of HEAL-D. In general, group cohesion and within-group interactions were seen to improve over time regardless of group size, as typical of group dynamics (Tuckman and Jensen 1977).	<p><i>“Yes. X had come from another group and Y obviously went back to their original group for the last session, didn't they? There seemed to be movement. Z and A had come from somewhere else. They stayed with us obviously once they... Yes, B went on holiday, so they then went to one of the others to pick up.”</i> Group 3 - Lead educator</p> <p><i>“Then also you get to meet different teachers, you know. Then you'll find how are they treating you or, you know.”</i> Focus group 2 - patients</p>
Venue	The community venues had limitations that educators had little control over. But they agreed it was important to resist the temptation to choose a university or hospital venue that they could better control. Some participants agreed but others claimed any setting would be acceptable though they liked the easy access of the chosen venues.	<p><i>“When I got there for the first delivery and the projector won't quite reach, and so we've all got to sit near the door, you think oh!”</i> Group 1 - Lead educator <i>“...you might be tempted to go for somewhere where you've got better control and you know you can set it up exactly as you want to, but actually that all becomes totally irrelevant. The power of it being a venue that is in a location for them and in a place where they feel some level of comfort and empowerment, I guess, I think is way more important.”</i> Group 1 - Lead educator</p> <p><i>“Because hospital would be much more clinical, wouldn't it?Definitely more relaxed and this is what we discussed, was very good, for me.</i></p>

		<p>Take this in the community.” Focus group 4 – patients</p> <p>“Makes no difference.</p> <p>This is a nice little room, and it's accessible to come, you know. All the buses and the thing, you know.” Focus group 2 - patients</p>
Educator pairings - lay/professional	<p>Both types of educator highlighted the balance and complementarity the pairings brought to the sessions. Lay educators were sometimes restricted in their role, sometimes by the programme design and sometimes also by the lead educator; two lead and two lay educators considered lay educators could have had a greater role in HEAL-D delivery.</p> <p>Participants and educators alike all said the educators did not have to match participants ethnically/culturally if they showed cultural sensitivity. But there was also much talk of the importance of the participants’ and lay educator’s shared cultural understandings and communication norms.</p> <p>Educators considered it important to join in with the activities, which helped with their bonding with participants and therefore their role as a trusted and credible source.</p>	<p>“[In general] I liked the way the two balanced out each other, they complemented each other as well, where the educator was leading I supported as a lay educator with any information.” Group 3/4 - Lay educator</p> <p>“Generally, I thought there were lots of instances where [the lay educator] was able to bring something that I couldn't. There were a couple of times that I felt like I didn't allow them to lead the taskI was a bit cross with myself for butting in with that and not letting them do what they should do.” Group 1 - Lead educator</p> <p>“I think it worked well. I guess it depends on peoples' experience because the main educator does quite a lot. There's certain sessions where the lay educator doesn't have such a big role, but then I guess if they were somebody who didn't have a lot of knowledge of diabetes anyway, it's probably not a problem... If somebody knew a bit more, there probably could have been a bit more scope to get the lay educator involved in a bit more so there's a different voice coming through.” Group 1 - Lay educator</p>
Social support - bringing a friend/family member for	<p>Educators did not realise participants could bring a companion to sessions, which needs to be made clearer. Most participants did seem to appreciate this but for various reasons decided not to or could not.</p>	<p>“I didn't bring anyone because there was no one to bring! I come for myself!”</p> <p>“Everybody I asked, but everybody works. My mum is almost to 80 years.”</p> <p>“No one would be prepared to get up in the morning to come and talk to us like this and think, well, what am I here for because I'm not diabetic, do you know what I mean?” Focus group 3 - patients</p>
STRUCTURE AND CONTENT		
Group structure – nurturing social connectedness	<p>Motivation was an important consequence of group social cohesion and educators and participants alike described instances of social support, incentivisation through sharing successes (and group normative identity-building), and positive problem-solving through failures. One educator voiced concerns over sustainability but considered implementation to have been so successful that this was likely: “I did feel that people were very clear about the importance of making these changes for the long-term, so hopefully that helps them to keep motivated when they're out there by themselves.” Group 3 - Lead educator.</p> <p>Others described the setting up of WhatsApp groups for post-HEAL-D sustained social cohesion, though some participants had to be supported in this as new to WhatsApp.</p>	<p>“You can see the progression, more opening up as we went on in the week, so the sharing was much, much forthcoming because they've got to know one another and they were learning from one another as well..” Group 2 - Lead educator</p> <p>“Every time they came, people were like, 'Oh, looks like you're losing weight', and they'd really get a good boost.” Group 4/5 - Lead educator</p> <p>“...they are then saying, 'Oh, I've tried this', so it's one from one another. They've made that change and then they are feeding back to the rest of the group rather than you, so it is about them looking, 'Oh, it did work for this person, it might work for me'.” Group 2 - Lead educator</p> <p>“X was saying that they go to a church regularly and wants to completely avoid the buffet. We were saying, 'You can't avoid it.' I think Y had said, 'Why not try on the salad side, and then go around, instead of having the rice first?' They said they would try that.” Group 2 - Lay educator</p>

Patient folder and written materials	Educators said participants struggled to maintain or use the course folder. However, participants in the focus groups appreciated and used the folders as a resource. Some said they would have preferred to access course materials on the HEAL-D website. It was agreed that since other participants had the converse preference the ideal was to have the option of either.	<p><i>"You're saying, 'Page three,' and they're on the wrong page, they're on the wrong week or the wrong, you know! It really disturbed the delivery, so I tended to not really use them very much."</i> Group 1 - Lead educator</p> <p><i>"Maybe make the books a bit smaller, a bit more portable, bigger writing.... when you ask them stuff and they can't really read it, they feel embarrassed! Yes."</i> Group 5 - Lay educator</p> <p><i>".....so sometime I go back, I, last night I was in bed, and I thought, 'Let me read up this thing again'."</i> Focus group 2 - patients</p>
Educational videos and PowerPoint slides	Videos and PowerPoint slides used in the delivery of the curriculum were generally considered successful in conveying simple messages clearly. However, over-reliance on them could lead to information overload.	<p><i>"When we had the slides with the portion sizes, for example, or where we were talking about mechanisms and maybe where we used the car going up the hill, those sorts of things. They were very engaged, and lots of nodding and lots of light-bulb moments going on."</i> Group 1 - Lead educator</p> <p><i>"The videos gave them real people who's been there and professionals and so on...It was, okay, another light bulb moment."</i> Group 3/4 - Lay educator</p>
Group exercise classes	Demonstrating was considered a powerful teaching method by educators though they observed this did not suit every participant. The participants also liked this approach. Participants and educators generally confirmed that participants developed confidence to try new things, through supportive professional instructors for physical activity sessions, demonstrations and problem-solving in a supportive session environment, and homework, targets and home DVDs graded to suit different abilities. However, there were some issues using the resources e.g. most participants did not have DVD players and said they would instead have been able to access videos on the internet using computers or their phones. The walking group was seen not just as a group exercise activity that built confidence through supportive learning but as an opportunity for educators to engage participants one-to-one and for everyone to bond. In the cookery session, participants learned new skills in preparing familiar foods such as how to make yam flour. Having both African and Caribbean recipes in one session was thought to work because <i>".... their cooking methods are so hugely variable, where their carbohydrate is not, it's massive, everybody is the same. It doesn't matter which form, it's a lot of."</i> Group 1 - Lead educator . This was also seen by both educators and participants as affording a particular opportunity	<p><i>"I think the participation and seeing that they could do it and complete the sessions, I think probably did build up some confidence to participate in future sessions."</i> Group 1 - Lay educator</p> <p><i>"The physical activity aspect of it, I've really stepped up the courage a bit to do more, be motivated by the exercise."</i> Focus group 4 - patients</p>
Home exercise DVDs		<p><i>"Yes, X said it would have been better to have the link on the phone, so they could have looked at it on the phone. They said it was quite hard to get the DVD. Yes, because if they don't have the DVD drive on the laptop, yes. A lot of laptops don't have the DVD drive."</i> Group 2 - Lay educator</p>
Participatory 'healthy cooking' session		<p><i>"There's a limit to how much people take in, isn't there, when there's talk, so I think it's good to break it up like that and just have that combination....My recollection is people did always have a go at whatever the activity was. I think it's good because it's a different dynamic, isn't it? You move on from talking, you're beginning to focus on something tangible, I suppose."</i> Group 3 - Lead educator</p> <p><i>"Then the one that I like the most is the cooking aspects. It has changed my cooking at home because all those vegetables, I only saw them in the market, not knowing how to prepare them or whether they are useful for us. We saw them practically and used them, so I've been using that as well, and this has given me more stamina."</i> Focus group 3 - patients</p>

	for inter-cultural sharing.	
Homework activity cards	Educators had mixed views as to the success of the homework task cards. This may have been dependent on the way educators handled them in the sessions; there was variation in the time educators spend discussing the homework, as evident from the adherence data below, as well as the interview and focus group data.	<p><i>"I don't think they did the homework, or even read it before coming in, or even when they left the previous week. They would still answer, but I could get the vibe that maybe they didn't really do anything....Even for the cooking session, they didn't come back with any recipes."</i> Group 2 - Lay educator</p> <p><i>"....[The task cards were] good because it gave a very specific focus, didn't it, to link in with the topic that had been discussed, so to go away and apply that. I think that was useful, yes..... My recollection is, yes, people always seemed to have had a go at it, seemed to be aware. There was a discussion about it, yes."</i> Group 3 - Lead educator</p> <p><i>"I didn't really use the card but I've got all the materials, because of the period we were doing these sessions, I was literally busy. Coupled with the kids, I went on holiday and everything's just..."</i> Focus group 4 - patients</p>
Goal-setting	Goal setting was introduced in week 1 but this was considered premature by educators as participants had insufficient knowledge with which to develop goals. By contrast it was considered a critical component of the last session (7) to ensure the benefits of HEAL-D would be sustained. It was noted that participants preferred to set their goals in their head rather than on paper, which made them hard for educators to evaluate.	<p><i>"I think the goals are easier to develop further along than week one.... I think in session one, I guess it would just be nice, probably not so much a goal, but say, 'What do you expect from the sessions?'"</i> Group 2 - Lay educator</p> <p><i>"My reflection is that that first session should have been pure education and not goal setting or anything of that. There just wasn't enough knowledge, and so it all got a bit muddled. We did a bit of both and didn't really do them very well."</i> Group 1 - Lead educator</p> <p><i>"we were actively encouraged. Like, 'This is a challenge, set yourself a goal every week. Set yourself a new different goal,' which is good because even now, like I said, I'm one step away from my waist goal, and I'm already thinking, all right, when I hit that, I've got to do the next goal. So I'm always planning that in my head already."</i> Focus group 1 - patients</p>
Self-monitoring measurements	Several components of the programme used self-monitoring and feedback equipment such as weighing scales and pedometers. There were several failings in the implementation of these measurement resources and equipment, although these issues did not prove critical.	<p><i>"Then the scales were too heavy to carry around, so they didn't come to the session, so we basically, in this programme, the weight thing got completely left. It just didn't get delivered."</i> Group 1 - Lead educator</p> <p><i>"Then I made them all do it themselves. Like, 'Do you know...?' They did it and I was saying when they go home they should do it. Then they weighed themselves."</i> Group 2 - Lay educator</p> <p><i>"I think the pedometers worked really well, and lots of them, we told them about the health app on their phones and they got those downloaded and that's worked really, really well....and also some of them talked about wanting to get watches that will count their steps."</i> Group 1 - Lead educator</p>

Table S7. Fidelity measures: content and time adherence scores by session (means)

<i>Session</i>	<i>1 It's in your hands!</i>	<i>2 Get Moving!</i>	<i>3 Taking Control!</i>	<i>4 Shape Up!</i>	<i>5 Drop the Pressure!</i>	<i>6 Cook & Taste</i>	<i>7 Plans for Life!</i>
<i>Number of observations</i>	1	2	4	2	2	1	1
<i>Content adherence</i>	1.73	1.42	1.86	1.08	1.92	1.86	1.89
<i>Time adherence (%)</i>	NR	101.88	107.57	90.00	72.38	NR	210.00

NR, not recorded.

