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Group Lifestyle Intervention With Mobile Health for Young Adults With Serious Mental Illness: A Randomized Controlled Trial

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Abstract

Objective: Evidence-based lifestyle interventions tailored to young adults with serious mental illness are needed to reduce their cardiometabolic risk. This study evaluated the effectiveness of a group lifestyle intervention ("PeerFIT") enhanced with mobile health (mHealth) compared with one-on-one mHealth coaching (basic education supported by activity tracking [BEAT]) for young adults with serious mental illness who were overweight or obese.

Methods: Participants were young adults ages 18–35 years with serious mental illness and a body mass index ≥25 kg/m^2, who were randomly assigned to PeerFIT or BEAT. Research staff collected data at baseline and at 6 and 12 months. Main outcomes were clinically significant changes from baseline in weight (≥5% weight loss), cardiorespiratory fitness (CRF; increase of

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>50 m on the 6-minute walk test), and cardiovascular disease (CVD) risk reduction (clinically significant weight loss or CRF improvement).

Results: Participants were 150 young adults with a mean ± SD body mass index of 37.1±7.4. Intent-to-treat analyses revealed no significant between-group difference for weight-loss, CRF, or CVD outcomes at 6 and 12 months. Participants in both conditions achieved clinically significant CVD risk reduction, weight loss, and CRF from baseline to 6 and 12 months, and all these improvements were statistically significant ($p<0.01$).

Conclusion: The PeerFIT group lifestyle intervention was not superior to one-on-one mHealth coaching in achieving clinically significant changes in weight, CRF, and CVD risk reduction. Although both interventions improved outcomes, low-intensity mHealth coaching may be a more scalable approach for addressing modifiable cardiometabolic risk factors among young adults with serious mental illness.

People with serious mental illness, including schizophrenia, bipolar disorder, and major depression, have higher mortality rates and shorter life expectancies than people in the general population (1, 2), largely because of higher rates of general medical diseases such as obesity and cardiovascular disease (CVD) (3, 4). Cardiometabolic risk factors are present among young adults with serious mental illness and related to unhealthy lifestyles, inequities in health care access and quality, and antipsychotic medications (5–7). Weight loss and improved cardiorespiratory fitness (i.e., how well the body takes in oxygen and delivers it to muscles and organs during exercise) can reduce cardiometabolic risk among individuals who are overweight or obese (8, 9). Studies of lifestyle interventions targeting these risk factors among people with serious mental illness have reported clinically significant improvements (10–14). However, research in this area has primarily focused on middle-age individuals, with relatively few young adults ages 18–35. Young people with serious mental illness may differ from older individuals in values, attitudes, and preferences for health behavior change, which could influence treatment engagement and outcomes. Thus, there is a need for lifestyle interventions tailored to the specific needs of these younger individuals.

Research in the general population suggests that young adults are more likely to be motivated by physical appearances and social influences and less likely to be influenced by health consequences than are older individuals (15). Young adults prefer personalized lifestyle interventions that promote autonomy and offer choice and emphasize self-improvement and fitness (16). Individuals with first-episode psychosis report an interest in goal-oriented exercise activities that included losing weight and increasing fitness and energy (17). In addition, young adults have expressed preferences for programs that are brief and use hybrid approaches that combine in-person contact and use of technology (16, 18). A secondary analysis from combined trials of the 12-month InSHAPE health coaching program revealed that young adults with serious mental illness who were overweight or obese experienced weight-loss and fitness benefits comparable to those of middle-age and older adults (19); however, enrollment among young adults in the trials was low, suggesting a need for lifestyle interventions specifically tailored to this group.

This need has prompted the development of the “PeerFIT” lifestyle intervention for young adults with serious mental illness (20). PeerFIT is a program previously piloted by our

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group with adults with serious mental illness; it consists of in-person experiential learning activities with facilitated problem solving and peer-to-peer support among other participants to promote weight loss and improve cardiorespiratory fitness (21, 22). Popular PeerFIT technologies include wearable activity trackers and text messaging, and social media are used to enhance in-person group sessions (23, 24). This study reports on the primary outcome of CVD risk reduction from the Fit Forward randomized controlled trial (RCT) testing the effectiveness of the PeerFIT lifestyle intervention for young adults with serious mental illness who were overweight or obese (body mass index [BMI]≥25 kg/m^2) and receiving services in community mental health centers (CMHCs).

METHODS

Study Overview

The Fit Forward trial was a two-arm RCT conducted in four CMHCs in the northeastern United States. The trial protocol has been published (20). The Dartmouth College Committee for the Protection of Human Subjects, the New Hampshire Department of Health and Human Services Institutional Review Board, and the Massachusetts Department of Mental Health Institutional Review Board approved this study. Participants gave written informed consent after receiving a description of the study.

Participants

Participants were young adults ages 18–35 years, had a chart diagnosis of serious mental illness, were overweight or obese (BMI≥25kg/m^2), and were fluent English speakers. Participants obtained medical clearance from their primary care provider to participate in the study. Exclusion criteria were current alcohol or drug use disorder, marked cognitive impairment (Mini-Mental Status Exam score <24) (25), taking olanzapine or clozapine for <2 months, taking anabolic steroids ≥4 days of the week for the previous month, a medical condition with a contraindication for participation in a weight-loss program (e.g., pregnant), a hearing or visual impairment that could interfere with ability to participate in the study, concurrent participation in a weight-loss or exercise program, or planning to leave the CMHC within 12 months.

Procedures

Participants were recruited between April 2017 and August 2019 through self-referrals or referrals from CMHC staff. Study staff at each agency screened participants for eligibility. Research interviewers then conducted a baseline assessment. After the baseline assessment, randomization to PeerFIT or the comparison condition was conducted at the participant level in blocks of four, stratified by site, birth sex, and psychiatric diagnosis (psychotic disorders, including schizophrenia, schizoaffective disorder, and psychotic disorder not otherwise specified vs. all other disorders). Blinded to participants' group assignment, research interviewers administered follow-up assessments at 6 and 12 months postrandomization. Participants received $50 for completing each assessment.

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Interventions

The interventions were led by mental health or fitness professionals who had a bachelors degree in a field-related discipline, such as counseling, fitness, psychology, or social work, and were trained and supervised by our research team in health coaching techniques. Different coaches delivered services to participants in the two study conditions.

PeerFit group lifestyle intervention.—PeerFIT is a 12-month, manualized group lifestyle intervention derived from core components of the evidence-based Diabetes Prevention Program (26), which includes setting clearly defined weight-loss and physical activity goals and using a standardized core curriculum delivered by lifestyle coaches who provide intensive, ongoing assistance throughout the program to help participants achieve and maintain their goals. PeerFIT consists of a 6-month intensive phase of twice-weekly group meetings, with groups including three to 12 participants and lasting approximately 60 minutes. An open-enrollment format allows new members to join at any time. The intensive phase was followed by a 6-month maintenance phase of weekly exercise sessions. Program goals were to achieve 5% weight reduction and to increase physical activity gradually to 150 minutes per week over a 6-month period and to maintain this amount of physical activity as recommended by the U.S. Department of Health and Human Services (27).

Participants were taught to reduce consumption of sugar-sweetened beverages and of foods high in sugar and fat, eat fewer processed foods, add more fruits and vegetables and lean protein to their diets, and participate in moderate-intensity physical activity. Social learning theory guided activities to stimulate peer-to-peer support among participants through modeling, observation, and role-play exercises (28). For the current study, we updated the PeerFIT curriculum with examples and activities relevant to young people. For example, PeerFIT coaches used online grocery store sale ads for experiential learning sessions during which participants identified weekly sale items at local grocery stores while creating a shopping list instead of using printed store ads (29, 30). Minor modifications to the intervention form (i.e., activities) to tailor the program for young adults did not change PeerFIT's function to support health behavior through health coaching, experiential learning, and peer-to-peer support (31).

PeerFIT used the following popular technologies to promote self-monitoring, build self-efficacy, and facilitate peer-to-peer support for health behavior change: a private Facebook group moderated by the coach and where participants could access information and view and post content and comments that support healthy lifestyles; wearable activity trackers (i.e., Fitbits); and weekly text messages (three to five texts per week) from the coach, with prompts for adherence to PeerFIT and reminders and encouragement for self-monitoring behaviors. Participants were encouraged to stay connected to PeerFIT by using the technology components of the program when attendance at in-person sessions was not feasible because of work schedules, unreliable transportation, child care responsibilities, and other barriers. Participants had continued access to the private PeerFIT Facebook group, Fitbit, and text messaging over the 12-month program period.

PeerFIT coaches were CMHC employees or were hired from the local community. Training occurred over 2 days and covered delivering the lifestyle curriculum and group coaching

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techniques, leading exercise groups, and using technology to enhance the program. After the initial training, PeerFIT coaches were supervised during weekly meetings by the study team and during once-monthly meetings with a certified personal fitness trainer. The study team monitored intervention fidelity with a checklist with prompts to facilitate discussions about intervention implementation during supervision meetings.

Comparison condition.—Basic education supported by activity tracking (BEAT) is a 12-month, one-on-one mobile health (mHealth) coaching intervention that uses evidenced-based behavioral strategies for weight loss and physical activity, including goal setting and self-monitoring (32), delivered by health coaches via telephone calls, text messaging, and wearable activity trackers. Participants received an initial 30- to 45-minute in-person orientation during which they were provided with and taught to use a body weight scale and a Fitbit for self-monitoring physical activity. The coach subsequently delivered five monthly 30-minute telephone coaching calls. During a 6-month period, participants were taught to weigh themselves regularly, track their daily step count, detect changes in weight and physical activity, identify and reduce barriers to achieving healthy changes, and recognize and celebrate their success. These strategies were also used in the PeerFIT intervention and delivered during group sessions, whereas the BEAT intervention was delivered one on one over the phone or through text messaging.

The BEAT lifestyle coach sent participants three to five text messages per week with reminders and encouragement for daily self-weighing, physical activity tracking, and engaging in healthy eating and physical activity. Participants had access to the Fitbit activity tracker and text-messaging support through month 12 of the study. BEAT coaches were either CMHC employees or members of the study team. BEAT training included a 4-hour initial training covering the BEAT lifestyle session curriculum and the text-messaging protocol. After the initial training, BEAT coaches met weekly with the study team for ongoing supervision. The BEAT coaches delivered the BEAT program exclusively and did not deliver the PeerFIT intervention.

Outcomes

The primary outcome was the proportion of participants who achieved CVD risk reduction, defined as either weight loss of 5% from baseline or an increase of >50 m on the 6-minute walk test (6MWT), an objective measure of functional exercise capacity (33), from baseline to 6 and 12 months. Secondary outcomes included clinically significant changes from baseline in weight (≥5% weight loss) and cardiorespiratory fitness (CRF, increase of .50 m in the 6MWT) from baseline to 6 and 12 months. Continuous outcomes included changes in BMI, weight, CRF measured on the 6MWT, and self-reported vigorous physical activity measured on the International Physical Activity Questionnaire (IPAQ) (34), as well as systolic and diastolic blood pressure, total cholesterol, high-density lipoprotein, low-density lipoprotein, triglycerides, and hemoglobin A1c collected by research interviewers during assessments. Because the fastest weight gain occurs in young adulthood (35) and psychiatric medications increase the risk for weight gain (36), weight-gain prevention was explored as the proportion of participants at or below their baseline weight at 6 and 12 months in each group.

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Data Analysis

Chi-square and t tests were used to compare demographic characteristics and outcome measures at baseline for the two groups. Treatment effects were evaluated by intent-to-treat analyses. The models examining the main outcomes and continuous changes in weight included baseline weight as a covariate. To test our main hypotheses, we used a generalized linear mixed-model (GLMM) framework to examine group difference in outcome changes during the follow-up period. GLMM takes into account correlations due to repeated measures and missing values. We specified logit link function and binomial distributions for the three binary outcomes at the individual level (≥5% weight loss or not, >50 m on 6MWT or not, and CVD risk reduction or not), and identity link function and normal distributions for continuous outcomes. We fit the model with the group (PeerFIT or BEAT), time (6 or 12 months), and group-by-time interaction effects, but we interpreted intervention effects by comparing group differences at 6 and 12 months within the GLMM framework with specific contrasts, respectively (37). The change from baseline for each group (i.e., within-group change) was also tested with the GLMM framework. Within-subject correlation over time was modeled by selecting unstructured covariance structures, and missing data were accommodated with maximum likelihood estimation (38). Exploratory analyses comparing the two groups on the proportion of participants at or below baseline weight at 6 and 12 months were conducted with chi-square tests. All tests were two-sided, with $p<0.05$ considered statistically significant. SAS statistical software, version 9.4, was used for the analyses (39).

RESULTS

Study Participants

In total, 150 eligible participants were randomly assigned to PeerFIT (N=76) or BEAT (N=74) (see flow diagram in the online supplement to this article). As shown in Table 1, the participants' mean±SD age was 28.4±4.5 years, with a mean BMI of 37.1±7.4; 55% (N=83) were female; 55% (N=82) were White and 30% (N=45) Hispanic; and 85% (N=128) had high school education or above. The most common psychiatric diagnoses at baseline were schizophrenia or schizoaffective disorder (40%, N=59), followed by bipolar disorder (20%, N=30). The PeerFIT and BEAT groups did not statistically significantly differ on any of the baseline characteristics. Overall, 83% (N=124) of the participants completed follow-up data collection at 6 months and 69% (N=104) at 12 months, with no differential attrition between the two groups at either time point. COVID-19 affected 12-month collection of weight and 6MWT data for 20 participants at two sites. Baseline characteristics did not differ between completers and noncompleters. Unblinding occurred at a single site during 12-month data collection, affecting 18% (N=19) of the 12-month assessments.

Intervention Attendance

The mean number of PeerFIT lifestyle sessions attended was 6.3±6.9 out of 24 offered and 5.5±6.5 out of 24 exercise sessions offered in the intensive phase (1–6 months) and 1.8±3.2 out of 24 exercise sessions offered in the maintenance phase (7–12 months). During the first 6 months, 75% (N=57) of PeerFit participants attended at least one lifestyle session and 70% (N=53) attended at least one exercise session. During months 7 through 12, 42% (N=32) of

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the participants attended one or more exercise sessions. Two-thirds (66%, N=50) of PeerFIT participants used the Facebook group, and 78% (N=59) used text messaging. The mean number of BEAT telephone coaching sessions attended was 4.261.8 of six offered. Almost all (97%, N=72) BEAT participants attended at least one coaching session, and 91% (N=67) used text messaging.

Primary and Secondary Outcomes

Results of analyses at 6 and 12 months for CVD risk reduction and clinically significant weight and CRF outcomes are shown in Table 2. No between-group differences were observed in the proportion of participants who achieved clinically significant changes from baseline in CVD risk, weight, or CRF. Group contrasts at 6 and 12 months showed no statistically significant differences between the BEAT and PeerFIT groups in changes in weight, CRF, or BMI (Table 3) or in blood pressure or lipid values (Table 4). The BEAT and PeerFIT groups did not significantly differ on mean scores of self-reported vigorous activity at 12 months ($t=0.89$, $df=103$, $p<0.05$).

As shown in Table 2, a significant proportion of participants in both groups achieved clinically significant weight loss, CRF improvement, and CVD risk reduction from baseline to 6 and 12 months. At 6 months, almost one-third of participants in PeerFIT (29%, N=18) and in BEAT (29%, N=17) achieved clinically significant reduction in CVD risk. At 12-month follow-up, 25% (N=11) of PeerFIT participants and 30% (N=12) of BEAT participants achieved CVD risk reduction.

Weight-Gain Prevention

At 6 months, more than half of the participants in both groups were at or below their baseline weight: 52% (N=34) of PeerFIT participants and 58% (N=34) of BEAT participants. Similar rates of weight-gain prevention were found at the 12-month follow-up: 50% (N=24) of PeerFIT participants compared with 54% (N=23) of BEAT participants were at or below their baseline weight.

DISCUSSION

This Fit Forward study has been among the first lifestyle intervention trials for young adults with serious mental illness. Our results show that the PeerFIT group lifestyle intervention with mHealth technology was not superior to BEAT, a one-on-one mHealth coaching intervention, in helping young adults with serious mental illness achieve clinically significant reductions in CVD risk. Participants in both groups achieved clinically significant weight loss, CRF improvements, and CVD risk reduction from baseline to 6 and 12 months. In addition, weight gain was prevented among more than half of the participants in both groups at 6 and 12 months.

The proportion of participants who achieved CVD risk reduction in PeerFIT and BEAT was lower than has been reported in previous lifestyle intervention trials for adults with serious mental illness (10–12), a finding that may be explained by lower CRF outcomes in this study. Our results show that participants in both PeerFIT and BEAT achieved weight-loss outcomes comparable to those of other lifestyle intervention trials for adults

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with serious mental illness, underscoring that young adults can also benefit from lifestyle interventions. The Peer-led Group Lifestyle Balance (PGLB) trial evaluated a 12-month lifestyle intervention delivered by peer specialists for adults with serious mental illness compared with usual care (12). PGLB was associated with clinically significant weight loss for 15% of participants at 6 months and 29% of participants at 12 months (12), comparable to the 12% and 20% of PeerFIT participants and 25% and 23% of BEAT participants who achieved clinically significant weight loss, respectively. In addition to weight loss, participants in our Fit Forward study benefited from weight control, which has been the focus of several landmark intervention trials for young adults in the general population (35, 40). Specifically, 50% of PeerFIT participants and 54% of BEAT participants were at or below their baseline weight at 12 months.

Fitness outcomes for PeerFIT participants were slightly lower than among participants in the PGLB trial at 6 months, with 18% of PeerFIT participants achieving >50-m increase on the 6MWTcompared with 26% of PGLB participants. During the maintenance phase of PeerFIT, the proportion of participants who achieved clinically significant CRF improvements dropped by more than half, to 8% at the 12-month follow-up. In contrast, the proportion of PeerFIT participants achieving clinically significant weight loss nearly doubled (12%–20%) from 6 to 12 months, suggesting that weight loss–related behaviors were more likely to be sustained than CRF-related behaviors. The general medical health consequences of low CRF tend to occur later in life and may be of less motivational value to young adults compared with more immediate concerns associated with obesity (e.g., appearance, self-esteem, and social relationships) (15, 41, 42).

Although participation in PeerFIT and BEAT was associated with CVD risk reduction, a subgroup of participants in the study gained weight or had a decline in CRF, highlighting opportunities for future research to evaluate adaptive interventions that support young adults who do not respond to behavioral lifestyle interventions. Moreover, obesity causes cardiovascular health problems that are compounded by smoking (43), and 38% of the participants were current smokers. Future research could target changing multiple health behaviors, including smoking and exercise, for more comprehensive health promotion and CVD risk reduction (44).

Low-intensity mHealth coaching may be a more scalable intervention than in-person groups for young adults at CMHCs. We found that participants' engagement in PeerFIT was less than optimal, despite the coaches' use of various strategies such as text message reminders and the private Facebook group. This low engagement may partly be attributed to competing demands for participants that conflicted with in-person group sessions, such as employment opportunities and family and child care responsibilities, or unforeseen challenges relating to substance use relapse, worsening psychiatric symptoms, or hospitalization. It is possible that young adults prefer individually tailored mHealth coaching interventions to group-based in-person health promotion. This possible preference emphasizes the potential utility of digital lifestyle intervention efforts (45), because these programs may fit the preferences and daily lives of young adults with serious mental illness. Future mixed-methods research with young adults with serious mental illness is needed to explore their preferences for the

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format and delivery of lifestyle interventions, including a focus on how gender, culture, and race-ethnicity may be related to preferences for weight-loss and fitness interventions.

The Fit Forward trial had several limitations. First, because of logistical constraints, assessors became unblinded at one of the four study sites during the study, which could have biased study assessments. Second, study retention at the 12-month follow-up was challenged by COVID-19 pandemic restrictions on in-person data collection at two sites. Finally, it was not possible to access participants' text-messaging data or data from their wearable activity trackers that would have enabled an analysis of program engagement and mechanisms of change and may have shown changes in physical activity according to objective measures of step count and minutes of activity.

CONCLUSIONS

The PeerFit group lifestyle intervention was not superior to one-on-one mHealth coaching in helping young adults with serious mental illness achieve clinically significant changes in weight, CRF, and CVD risk. Importantly, both interventions significantly improved outcomes and prevented weight gain among young adults comparable to findings of other trials of lifestyle interventions for individuals with serious mental illness. Low-intensity mHealth coaching may be a scalable innovation in care for young adults in CMHCs. Future research evaluating strategies to implement mHealth lifestyle interventions for young adults in routine mental health care settings, including studies of how race and ethnicity and social determinants of health influence engagement and outcomes, will advance the field's efforts to address modifiable risk factors among young adults with serious mental illness and may help lower their CVD risk.

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HIGHLIGHTS

- This study evaluated the effectiveness of an in-person group lifestyle intervention (PeerFIT) enhanced with mobile health (mHealth) for young adults with serious mental illness who were overweight or obese.
- The PeerFIT group intervention was not superior to one-on-one mHealth coaching in achieving clinically significant changes in weight or cardiorespiratory fitness.
- Participants in both groups improved significantly on weight and fitness outcomes, and weight gain was prevented in more than half of the participants in both groups.
- Low-intensity mHealth coaching may be a scalable intervention for reducing cardiovascular risk among young adults in community mental health centers.

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TABLE 1.

Baseline characteristics of 150 study participants, by healthy lifestyle intervention group[a]

	Total (N=150)		PeerFIT (N=76)		BEAT (N=74)	
Characteristic	**N**	**%**	**N**	**%**	**N**	**%**
Age in years (M±SD)	28.4±4.5		28.2±4.4		28.5±4.7	
Weight in lbs (M±SD)	231.8±46.2		236.9±59.3		231.6±46.2	
Body mass index in kg/m^2 (M±SD)	37.1±7.4		37.2±8.3		37.1±7.4	
Female	83	55	41	54	42	57
Race-ethnicity						
White	82	55	44	58	38	52
Black	39	26	18	24	21	28
Asian	1	1	1	1	0	0
More than one race	12	8	6	8	6	8
Refused to answer	16	10	7	9	9	12
Hispanic	45	30	22	29	23	31
Psychiatric diagnosis						
Schizophrenia or schizoaffective disorder	59	40	33	44	26	36
Psychotic disorder not otherwise specified	6	4	3	3	3	4
Bipolar disorder	30	20	11	15	19	26
Depression	18	12	11	15	7	8
PTSD	26	17	11	15	15	20
Anxiety	5	3	3	3	2	3
Mood disorder not otherwise specified	6	4	4	5	2	3
Taking any antipsychotic medications	106	71	56	74	50	68
Current smoker	57	38	30	40	27	37
Currently married	13	9	5	7	8	11
High school education or above	128	85	66	87	62	84
Current working (part-time or full-time)	28	19	15	20	13	18
Housing						
Living independently	70	47	31	41	39	53

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Characteristic	Total (N=150)		PeerFIT (N=76)		BEAT (N=74)	
	N	%	N	%	N	%
Living with family	43	29	24	32	19	26
Supervised or supported housing	37	24	21	27	16	21
In-person contact with parents (every day or at least weekly)	90	60	48	63	42	57

[a]The two intervention groups did not statistically differ in any of the characteristics (p>0.05; means were compared by t tests, and proportions by chi-square tests). BEAT, basic education supported by activity tracking.

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TABLE 2.

Proportion of participants achieving weight loss, improved cardiorespiratory fitness, and reduced cardiovascular disease (CVD) risk at 6- and 12-month follow-ups

					Between-groups effect[c]						Within-groups effect[d]					
	6 months		12 months		6 months			12 months			6 months			12 months		
Outcome	Estimate[a]	SE[b]	Estimate[a]	SE[b]	t	df	p	t	df	p	t	df	p	t	df	p
≥5% body weight loss from baseline					−1.78	123	.07	−.35	96	.72						
PeerFIT	.12	.04	.20	.06							−5.14	122	<.001	−3.91	95	<.001
BEAT[e]	.25	.06	.23	.06							−3.61	123	<.001	−3.42	96	<.001
>50-meter increase on 6-minute walk test from baseline					.78	120	.43	−.70	84	.48						
PeerFIT	.18	.05	.08	.04							−4.45	120	<.001	−4.74	88	<.001
BEAT[e]	.13	.04	.12	.05							−4.82	120	<.001	−4.53	88	<.001
Clinically significant reduction in CVD risk[f]					−.04	118	.97	−.48	89	.63						
PeerFIT	.29	.06	.25	.07							−3.17	118	<.002	−3.13	91	<.002
BEAT[e]	.29	.06	.30	.07							−3.04	118	<.003	−2.54	90	<.013

[a] Estimated proportions from the model may not be exactly the same as observed proportions.

[b] SE, standard error.

[c] Generalized linear mixed-model fit with the global group (PeerFIT or BEAT), time (6 or 12 months) and group × time interaction effects; intervention effects were interpreted by comparing group differences at 6 and 12 months.

[d] Generalized linear mixed-model framework was used to test for statistically significant changes from baseline within each group.

[e] BEAT, basic education supported by activity tracking.

[f] Defined as achieving either a 5% weight loss from baseline or a >50-meter increase from baseline on the 6-minute walk test.

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TABLE 3.

Weight, body mass index, fitness, and physical activity outcomes at 6- and 12-month follow-ups for each intervention[a]

							Between-groups difference					
	Baseline		6 months		12 months		6 months			12 months		
Outcome	M	SD	M	SD	M	SD	t	df	p	t	df	p
Weight (kg)							.54	124	.59	.61	109	.54
PeerFIT	107.6	26.9	109.7	26.3	109.2	27.6						
BEAT	105.1	20.9	106.7	22.1	106.9	22.5						
Body mass index							.56	124	.57	.65	113	.52
PeerFIT	37.2	8.3	37.8	8.1	38.3	8.7						
BEAT	37.1	7.4	37.5	7.7	37.6	7.2						
Cardiorespiratory fitness 6MWT distance (feet)							.26	117	.79	1.00	88	.32
PeerFIT	1,398	296	1,386	296	1,357	271						
BEAT	1,424	250	1,426	248	1,319	332						
IPAQ total vigorous score (log of MET min)							1.15	122	.25	.89	104	.37
PeerFIT	3.2	3.4	4.3	3.7	3.4	3.6						
BEAT	2.4	3.3	3.7	3.7	2.6	3.3						

[a]6MWT, 6-minute walk test; BEAT, basic education supported by activity tracking; IPAQ, International Physical Activity Questionnaire; MET, metabolic equivalent of task.

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TABLE 4.

Cardiometabolic outcomes at 6- and 12-month follow-ups for each intervention[a]

							Between-groups difference					
	Baseline		6 months		12 months		6 months			12 months		
Outcome	M	SD	M	SD	M	SD	t	df	p	t	df	p
Systolic blood pressure							.97	121	.33	−.02	93	.98
PeerFIT	115.1	12.8	115.9	13.4	114.2	13.3						
BEAT	116.4	15.1	115.7	12.1	115.6	13.1						
Diastolic blood pressure							2.20	122	.03	−.03	96	.98
PeerFIT	77.6	8.4	79.9	9.9	77.3	10.6						
BEAT	78.8	10.8	77.7	9.8	77.3	10.6						
Total cholesterol (mg/dL)							−.67	113	.50	−.885	86	.38
PeerFIT	166.0	41.8	164.5	40.4	163.2	39.8						
BEAT	174.2	45.9	171.1	41.3	172.8	54.1						
Low-density lipoprotein (mg/dL)							−1.9	102	.06	−.72	73	.47
PeerFIT	94.0	32.3	88.9	25.8	92.7	27.4						
BEAT	97.5	35.6	99.9	36.1	97.1	46.6						
High-density lipoprotein (mg/dL)							.716	115	.48	−.95	86	.34
PeerFIT	47.1	18.1	44.1	12.2	43.9	11.2						
BEAT	42.6	13.5	41.6	9.3	43.3	11.8						
Hemoglobin A1c (%)							−.05	113	.96	.22	87	.83
PeerFIT	5.3	.8	5.3	.7	5.6	1.4						
BEAT	5.3	1.0	5.3	.6	5.5	.7						

[a]BEAT, basic education supported by activity tracking.