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Impact of Online Weight Management with Peer Coaching on Physical Activity Levels of Adults with Serious Mental Illness

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Abstract

Objective: Many adults with serious mental illness are sedentary and experience significant medical illness burden. The present study examined the effectiveness of an online-delivered weight management intervention with peer coaching (WebMOVE) for increasing general physical activity among adults with serious mental illness.

Methods: The present study utilized quantitative and qualitative data from a randomized controlled trial (N=276) comparing three conditions: WebMOVE, in-person weight management for adults with serious mental illness (MOVE SMI), or usual care. Participants completed assessments of general physical activity at baseline, 3 months, and 6 months; and a qualitative assessment at 6 months. Mixed effects models examined group by time interactions on general physical activity.

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The authors have no conflicts of interest to disclose.

Results: Comparing MOVE SMI to usual care, there were significant group differences for total physical activity at 3-months (t=3.06, df=272, p=.002) and 6-months (t=3.12, df=272, p=.002), for walking at 6- months (t=1.99, df=273, p=.048), for moderate physical activity at 6-months (t = 2.12, p=.035), and for vigorous physical activity at 6-months (t = 2.34, p=.020). Comparing WebMOVE to usual care, there was a significant group difference for total physical activity at 6-months (t=2.02, df=272, p=.044), and a trend for a group difference for walking at 6-months (t=1.78, df=273, p=.076). These findings reflected declines in usual care and increases in MOVE SMI or WebMOVE, respectively.

Conclusions: In-person weight management counseling increased total physical activity and led to initiation of moderate/vigorous physical activity among adults with serious mental illness. Computerized weight management counseling with peer support more gradually increased total physical activity levels.

Adults with serious mental illness exhibit elevated rates of obesity and cardiovascular disease which contribute to dramatically reduced life expectancy (1–2). The majority of adults with serious mental illness are also sedentary (3). Physical inactivity is a major cause of morbidity and mortality (4); however, little is known about how to increase physical activity levels in this group. While weight management interventions include components to increase physical activity, randomized controlled trials (RCTs) of these interventions have focused on weight outcomes (5–8), and the only such RCT to report on physical activity outcomes reported a negative result (9).

Two RCTs have demonstrated that the provision of opportunities for supervised physical activity can increase general physical activity among adults with serious mental illness (10–13). However, there are many barriers to providing opportunities for supervised physical activity in routine mental health care, including safety concerns and lack of trained staff and facilities (14–15). Strategies to increase general physical activity among adults with serious mental illness when in-vivo participation in physical activity is not possible are needed.

Delivering behavioral interventions online may improve their effectiveness by providing access in participants' own communities, allowing immediate application of the lessons taught in real-world settings. In addition, technology-based interventions can be enhanced with social connection to a peer facilitator, who can encourage practice and generalization (16–17). Whether an online-delivered behavioral intervention with peer coaching can increase general physical activity among adults with serious mental illness is unknown.

In a recent RCT with adults with serious mental illness, a web-based version of a VA weight management program (VA MOVE!) tailored for adults with serious mental illness and enhanced with peer coaching (WebMOVE) was compared to in-person delivery of VA MOVE! tailored for adults with serious mental illness (MOVE SMI) and usual care. Participation in WebMOVE was associated with significant weight loss among obese participants with serious mental illness, while the other conditions were not (18). The present study aimed to examine whether WebMOVE also led to increased general physical activity, compared to MOVE SMI or usual care. Qualitative analysis examined barriers and facilitators to participation in exercise in the active conditions.

Methods

Participants and Procedures

The present study is a secondary data analysis of data collected during a large RCT of a computerized weight management intervention for Veterans with serious mental illness (18) at the Greater Los Angeles VA Medical Center. Participants were recruited via clinic list and study flyers posted in clinic waiting areas. Inclusion criteria were: age 18 and older, serious mental illness diagnosis (schizophrenia spectrum disorders, affective psychoses, or post-traumatic stress disorder), body mass index (BMI) above 30 or BMI over 28 with weight gain of at least 10 pounds in the last three months. Participants completed the Physical Activity Readiness Questionnaire (PAR-Q; 19) which provided information about whether they were healthy enough for exercise. Individuals with PAR-Q scores greater than 1 required approval by a physician. Participants were excluded for dementia, pregnancy/nursing, history of bariatric surgery, recent psychiatric hospitalization (past month), limited control over food preparation, and current attendance of weight loss programming.

All study procedures were approved by the appropriate Institutional Review Board. Written informed consent was obtained from all participants. Eligible consented participants completed baseline assessments, including demographic information, weight, height, and self-reported physical activity as assessed by the International Physical Activity Questionnaire (20). Following baseline assessment, participants (N=276) were randomized to WebMOVE, MOVE SMI, or usual care, with stratified randomization based on weight gain liability of prescribed antipsychotic medications. Assessments were repeated at 3 months and 6 months after randomization. Assessors were blind to participant intervention condition. See online supplement for CONSORT diagram.

Intervention Conditions

MOVE SMI is a manualized version of the VA MOVE! weight management program, tailored for adults with serious mental illness (9). It consists of 8 in-person individual sessions and 16 in-person group sessions delivered by a mental health provider over 6 months. Individual sessions included goal setting, review of diet/exercise habits, and consolidation of group session material. Group sessions included weekly weigh-ins, didactic information (e.g., exercise safety, emphasis on low to moderate physical activity such as stretching, walking), goal-setting, and review of progress/challenges.

WebMOVE is a computerized version of MOVE SMI with the same curriculum, delivered via 30 online interactive modules (15 on diet; 15 on physical activity). Modules included text and audio/video based information, tracking of activity and weight, and individualized goal-setting. Each WebMOVE participant received a pedometer. Peer coaches with lived experience of serious mental illness conducted weekly 25–30 minute coaching calls with each participant, providing individualized follow-up, positive reinforcement, motivational enhancement, specific physical activity suggestions, and problem-solving barriers such as time constraints and mental health symptoms. Participants had access to the online system and the peer coaching support for 6 months.

Five peer coaches, 2 females and 3 males, who were paid VA employees, delivered the manualized intervention over the course of the study period. The coaches were all Veterans, but varied in their previous experiences providing peer support and in their educational backgrounds. The coaches each received 5 months of training by masters and doctoral-level study staff. Each peer coach was provided with a detailed manual with specific instructions for each coaching call. Training included both didactic training in the manual and experiential training in coaching. Experiential training started with the peer joining a master therapist for live coaching sessions and then leading these sessions. When the master therapist considered the peer ready to coach independently, the peer began to deliver the curriculum him or herself. All peer coaches received weekly clinical supervision from the study co-PI, a psychologist. Two of the peer coaches provided the majority of the peer support for the study, with the others having briefer tenure on the project. The hiring of peers for this project preceded the certification process for peer specialists in VA.

Participants in usual care received a handout on the benefits of weight loss and could attend standard services available at the medical center, including the standard VA MOVE! weight management program.

International Physical Activity Questionnaire – Short Form

The Short Form of the International Physical Activity Questionnaire (IPAQ) measured self-reported physical activity in the past 7 days. The IPAQ is a widely used questionnaire measure with acceptable psychometric properties, reliable and valid for use in individuals with psychotic disorders (20–21). The IPAQ queries respondents regarding minutes spent walking, being moderately physical active, and being vigorously physically active while working, getting from place to place, engaging in home maintenance and caregiving activities, and during leisure time. A summary score of total physical activity can be produced by multiplying the minutes spent in each type of activity by its energy requirements, defined in metabolic-equivalent expenditure minutes (MET-minutes). METs are multiples of the resting metabolic rates; an average MET score has been derived for each type of physical activity (22). Outcome measures for the present analyses were MET minutes spent walking, doing moderate physical activity, doing vigorous physical activity, and total MET-minutes.

Quantitative Data Analysis

For baseline demographics and BMI, descriptive statistics were calculated and global tests of differences between the three groups were performed. Because of a high number of zero values for moderate and vigorous MET-minutes, the percent engaging in any moderate or vigorous physical activity, and means and standard deviations among those with non-zero values were calculated.

Square root transformations were applied to walking MET-minutes and total MET minutes to reduce skew prior to analysis. Linear mixed effects models with group, time, and group-by-time interaction terms were used to examine differences in change from baseline to the three-month and six-month time points for these two IPAQ outcomes, comparing each active intervention to the usual care group.

Customary variable transformations for moderate and vigorous MET minutes were unsuccessful in eliminating discontinuity due to zero-inflation, hence a mixed distribution mixed effects model (also known as a 'two-part' model) was used (SAS 'mixcorr' macro) (23). This model combines a sub-model for the probability of occurrence of nonzero MET minutes (logistic regression model) and a sub-model for the probability distribution of MET minutes conditional on a greater than zero amount (lognormal regression model to account for positive skew). Group, time, and, group-by-time interaction terms were included in each part of the two-part model, comparing each active intervention to the usual care group.

Qualitative Procedures

A quota sampling approach was used to select a random sample of participants (n = 48) in the active treatment groups (WebMOVE and MOVE SMI) to participate in a semi-structured interview after completion of 6-month quantitative assessment. This interview assessed facilitators and barriers to program participation, including the physical activity component of the interventions. The interviews were digitally recorded and transcribed for analysis. Atlas.ti was used to organize the data into thematic sections. Two members of the research team used an iterative process to code the data and to identify sub- and over-arching themes from the open codes. Any discrepancies in coding were reconciled prior to theme development.

Results

Quantitative Results

Participant demographic information and BMI are displayed in Table 1; there were no significant differences between groups on these variables. Intervention attendance did not differ significantly between groups. In both active conditions, a proportion of participants did not attend any sessions/complete any modules (n=17 for MOVE SMI and n=22 in WebMOVE). On average, among participants who attended/completed at least one, MOVE SMI participants attended 9.7 ± 6.2 sessions out of 24, and WebMOVE participants completed 14.7 ± 12.2 modules out of 30. IPAQ descriptive statistics over the three time points are displayed in Tables 2, 3, and 4.

Results for the linear mixed effects models for walking and total MET minutes are displayed in Table 2. For walking MET minutes, comparing MOVE SMI to usual care, there was a trend for significance in mean change at 3 months and a significant difference in mean change at 6 months. Also for walking MET minutes, there was a trend for significance in mean change comparing the webMOVE and usual care conditions at 6 months. For total MET minutes, there were significant differences in mean change comparing MOVE SMI to usual care at 3-months and 6-months. Also for total MET minutes, there was a significant difference in mean change comparing the WebMOVE and usual care groups at 6-months. These differences reflected increases in the active conditions and declines in the usual care condition.

Results for the first part of the two-part mixed effects models (logistic regression), focused on percentage of participants engaged in any moderate or vigorous activity, are displayed in

Table 3. For moderate and vigorous physical activity, at 6-months, the percentage of participants engaging in any moderate and vigorous physical activity decreased in the usual care group and increased in the MOVE SMI group, resulting in significant group-by-time interactions.

Results for the second part of the two-part mixed effects models (log-normal regression), focused on mean changes in moderate and vigorous physical activity among those with nonzero values, are displayed in Table 4. For vigorous MET minutes, at 6-months there was a significant group-by-time interaction comparing WebMOVE to usual care and MOVE SMI to usual care, reflecting increases in the active conditions and a decrease in usual care.

Qualitative Results

Participants described three main exercise-related themes: types of exercise performed, exercise motivation, and barriers to exercise. Exemplary quotes for each of these themes are presented in Table 5. In the WebMOVE condition, participants also described their experiences with the peer coaches.

Types of Exercise Performed—Overwhelmingly, participants in both the WebMOVE and MOVE SMI groups walked as their primary source of exercise. Participants with physical limitations, due to disabilities or weight, described walking as low-impact and manageable. More able-bodied participants used walking as the foundation for additional exercise. Only MOVE SMI participants performed additional types of exercises, with strength training reported most frequently.

Motivation to Exercise—The social aspect of exercise was an important motivation for participants to begin and sustain physical activity. Participants in both active conditions described walking with friends, family, peers, or pets, as helpful and motivating. Being accountable to others helped participants sustain physical activity. In WebMOVE, the peer coaches served this function. The WebMOVE group also described how the provided pedometers helped them with goal-setting and motivation for walking. Positive health outcomes (weight loss, changes in A1c and cholesterol, improved quality of life, longevity) motivated participants in both treatment groups to exercise.

Barriers to Exercise—Lack of motivation and time were the primary barriers identified by participants. Veterans with physical limitations/disabilities described modifying recommended exercises. Chronic/acute pain was also a factor. To a lesser extent, participants described how mental health symptoms interfered with their intentions to exercise (e.g., symptoms of depression could negate well-intentioned plans to go walking). One participant lamented that they were eating more as a result of exercising more. The additional energy their body needed to exercise resulted in an increase in calories consumed.

Role of the Peer Coach—Participants' remarks about peer coaches were primarily positive and involved the program in general, with only a few exercise specific comments. Peer coaches played an important role in reviewing program content, keeping participants mindful of weekly goals, and offering accountability, motivation, and support. Coaches

provided individualized recommendations for physical activity and technical support such as help logging onto the program, using the pedometer, and tracking progress online.

Discussion

Among adults with serious mental illness, both in-person delivery of a tailored, manualized version of the VA MOVE! weight management program (MOVE SMI) and participation in a web-based version with peer coaching support (WebMOVE) led to greater increases in total physical activity than usual care. MOVE SMI led to greater and more rapid increases in physical activity across types (walking, moderate, and vigorous activity), while WebMOVE led to gradual increases in primarily walking behavior. Individuals in the usual care condition exhibited a decrease in total physical activity across the six month intervention period, which may represent a waning of motivation to engage in health behaviors without the support of a structured intervention. The present findings are in contrast to what was found for weight loss outcomes in a previous study, in which the WebMOVE condition was associated with weight loss, while MOVE SMI was not (18). It is possible that weight loss outcomes were due to changes in diet rather than changes in physical activity. Notably, the weight loss analyses included only individuals who attended at least one intervention session, while the present study used an intent-to-treat approach.

Participation in the MOVE SMI condition helped some individuals initiate moderate/vigorous physical activity. While WebMOVE participants exclusively endorsed walking as their preferred form of physical activity, MOVE SMI participants reported engaging in weight and strength training as well. Attending in-person groups as part of MOVE SMI may have afforded participants opportunities to exchange ideas, leading to greater variation in exercise behaviors. Alternatively, individuals who were leaving their communities to attend the in-person MOVE SMI sessions may have felt more empowered to engage in moderate/vigorous activity outside the home; e.g., lifting weights at a fitness center. WebMOVE participants, although satisfied with the convenience the web-based program offered, suggested the program be supplemented with in-person exercise groups. These findings indicate that face-to-face and/or group intervention may be particularly important for the promotion of moderate/vigorous exercise among adults with serious mental illness.

Participation in both active conditions was associated with a modest and gradual increase in walking behavior compared to usual care. Thus, to increase walking, especially via a web-based intervention, support for gradual change over a longer time period may be indicated.

One important observation of note is the low prevalence of any moderate/vigorous activity among the participants in this sample. While any increase in physical activity is worth pursuing, recommendations indicate that a mix of exercises in terms of type and intensity is ideal (24). Helping adults with serious mental illness initiate moderate/vigorous activity is an important target for intervention with potential for significant clinical impact. The present study indicates that a face-to-face, group-based intervention is indicated to promote initiation of more strenuous physical exercise. Thus, WebMOVE, which was previously shown to be feasible and effective for weight loss (18) could be supplemented with an inperson exercise component.

Per qualitative interviews, WebMOVE participants were generally satisfied with the peer coaches, who were seen as a source of general support to promote engagement and facilitate use of the online modules. Few participants commented specifically about how the peers helped them with exercise. Thus, the value of peer providers in health and wellness interventions may lie in their ability to enhance motivation for and navigation of this programming, as opposed to their ability to promote specific health behaviors; see (25) for a discussion of this issue.

Qualitative findings also indicated that, in addition to time and motivation, the primary constraint on participants' ability to exercise was a physical limitation/disability. To address this, participants suggested that program content include modified exercises for participants with physical limitations, perhaps presented by a physical therapist, in-person or as a video module. This recommendation is particularly pertinent to the initiation of moderate/vigorous physical activity, which is more likely to pose a safety concern for individuals with physical limitations.

The present study had a number of limitations. Although the IPAQ is a well-validated measure of general physical activity, it is based on self-report; future studies could use objective physical activity measures (e.g., pedometers). The study was conducted at a single site in an urban area, and warrants replication in other geographical locations. The sample consisted of a majority male, Veteran population, and may not generalize to other adults with serious mental illness.

In conclusion, in an RCT with adults with serious mental illness, a generally sedentary population with high medical illness burden and complex care needs, in-person delivery of weight management counseling increased total physical activity and led to initiation of moderate/vigorous physical activity. Computerized weight management counseling with peer support also impacted total physical activity, and may need to be continued for longer than six months and supplemented with an in-person physical activity component to maximize effects.

Supplementary Material

Refer to Web version on PubMed Central for supplementary material.

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 $\label{eq:Table 1.} \textbf{Baseline Participant Demographics by Treatment Group (N=276)}^a$

	WebMOV	VE	MOVE S	SMI	Usual C	are
	n=93		n=95		n=88	
	n	%	n	%	n	%
Age (M±SD)	54.7 ± 8.9		53.7 ± 9.6		54.2 ± 9.9	
Gender (male)	85	91	88	92.6	86	97.7
Race						
Caucasian	37	40	40	42	34	39
African-Ameri can	44	47	47	50	47	53
American Indian	8	9	5	5	3	3
Asian	1	1	4	4	2	2
Pacific Islander	1	1	0	0	4	5
No response	7	8	7	7	3	3
Ethnicity (Hispanic)	15	16	16	17	9	10
Education (Highest Degree)						
Less than HS	2	2	5	5	6	7
HS or some college	64	69	60	63	56	64
College 2- or 4- year degree	24	26	27	28	22	25
Some grad school or degree	3	3	3	3	4	5
Body Mass Index (M±SD)	34.2 ± 5.3		34.9 ± 5.0		34.4 ± 5.6	

^aM, mean; SD, standard deviation; HS, high school

^bParticipants could choose more than one

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Table 2.

Descriptive statistics and linear mixed models for IPAQ walking and total MET minutes^a

Variable/Treatment Group		Baseline	•		3 mos.			6 mos.		Ba	Baseline to 3 mos.	3 mos.	2	Bas	Baseline to 6 mos.	6 mos.	c
	и	Mean	SD	u	n Mean	SD	и	Mean	SD	Est^b	t	fр	d	Est_b^b	t	fp	d
Walking MET mins																	
WebMOVE	92	859	931	69	839	1108	92	748	626	2.59	0.92	273	.357	4.61	1.78	273	920.
MOVE SMI	94	443	516	62	641	668	81	200	493	4.31	1.88	273	.061	4.54	1.99	273	.048
Usual Care	87	747	1000	<i>L</i> 9	715	1107	74	545	710	Ref		:		Ref		-	1
Total MET mins																	
WebMOVE	92	1277	1544	69	1421	1651	75	1316	1675	5.06	1.47	272	.144	7.34	2.02	272	.044
MOVE SMI	63	838	1096	62	1329	1807	81	1183	1773	10.43	3.06	272	.002	11.54	3.12	272	.002
Usual Care	98	1586	2686	<i>L</i> 9	1126	1658	73	916	1563	Ref		:		Ref		-	ŀ

^aPAQ, International Physical Activity Questionnaire; MET mins, metabolic-equivalent-expenditure minutes in the past week; SD, standard deviation; Est., estimate. METs are multiples of the resting metabolic rates; walking = 3.3 METs; moderate physical activity = 4.0 METs; vigorous physical activity=8.0 METs.

 $b_{\mbox{\footnotesize Square-root}}$ transformed before analysis to correct right skew

 $^{^{\}mathcal{C}}$ Difference in mean change

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Table 3.

Descriptive statistics and part one (logistic regression) of two-part mixed models for IPAQ moderate and vigorous MET minutes^a

Variable/ Treatment Group	Bas	Baseline	3 n	3 mos.	9 u	6 mos.	Baseli	Baseline to 3 mos.	mos.	Baseline to 6 mos. c	ne to 6	mos.
	n (total)	$egin{array}{ c c c c c c c c c c c c c c c c c c c$	n (total)	$\mathrm{PE}^b~(\%)$	n (total)	$ ext{PE}^{b}$ (%)	Est.	t	d	Est.	t	d
Moderate MET mins.												
WebMOVE	93	37	69	42	76	30	0.76	1.28	.200	0.61	1.03	.303
MOVE SMI	94	34	62	43	81	37	1.01	1.73	.085	1.23	2.12	.035
Usual Care	28	41	<i>L</i> 9	33	73	25	Ref			Ref	-	1
Vigorous MET mins.												
WebMOVE	93	24	69	25	77	19	0.49	0.65	.517	1.08	1.51	.133
MOVE SMI	95	17	79	61	81	21	0.49	0.64	.522	1.70	2.34	.020
Usual Care	87	20	<i>L</i> 9	15	73	7	Ref	-	1	Ref	-	1

metabolic rates; moderate physical activity = 4.0 METs; vigorous physical activity=8.0 METs. Analysis model assumed a logistic regression model. Analysis program provided p-values but not degrees of ^aPAQ, International Physical Activity Questionnaire; MET mins, metabolic-equivalent-expenditure minutes in the past week; PE, percent engaged; Est., estimate. METs are multiples of the resting freedom for t-tests. Page 13

 $^{^{}b}$ Percent engaged in moderate or vigorous physical activity.

 $^{^{\}mathcal{C}}$ Difference in change in percent engaging in moderate or vigorous physical activity (on log odds scale).

Table 4.

Descriptive statistics and part two (lognormal regression) of two-part mixed models for IPAQ moderate and vigorous MET minutes^a

Variable/ Treatment Group		Baseline			3 mos.			6 mos.		Baseli	Baseline to 3 mos.	b.sor	Baseli	Baseline to 6 mos. ^d	p.sou
	q^{u}	Mean	SD^c	q^u	Mean	$\mathrm{SD}_{\mathcal{C}}$	q^{u}	Mean	$\mathrm{SD}_{\mathcal{C}}$	Est.	ı	d	Est.	t	d
Moderate MET mins.															
WebMOVE	34	772	806	29	455	497	23	815	783	-0.51	-1.61	.109	0.02	0.07	.945
MOVE SMI	32	482	400	34	923	1419	30	098	904	0.24	0.77	.441	0.39	1.12	.265
Usual Care	36	883	1526	22	699	500	18	843	905	Ref			Ref		
Vigorous MET mins.															
WebMOVE	22	1453	1543	17	1586	1640	15	1653	2145	0.56	1.14	.253	1.18	2.15	.033
MOVE SMI	16	1353	1267	15	1528	1238	17	1737	1911	0.36	0.70	.483	1.37	2.44	.015
Usual Care	17	2372	2741	10	1280	1059	5	2344	4337	Ref	:	:	Ref	1	:

metabolic rates; moderate physical activity = 4.0 METs; vigorous physical activity=8.0 METs. Analysis model assumed a log-normal model to account for right skew. Analysis program provided p-values ^aPAQ, International Physical Activity Questionnaire; MET mins., metabolic-equivalent-expenditure minutes in the past week; SD, standard deviation; Est., estimate. METs are multiples of the resting but not degrees of freedom for t-tests.

bNumber of participants engaged in moderate or vigorous physical activity.

 $^{\mathcal{C}}$ Mean and standard deviation among participants engaged in moderate or vigorous physical activity.

d Difference in mean change among those engaged in moderate or vigorous physical activity (on log scale).

 Table 5.

 Qualitative Themes, Exemplary Quotes, and Representativeness by Treatment Group.

Themes	Exemplary Quote
Types of exercise performed	
Strength training	"I work out. I do leg lifts. I do curls. I do back arms and I do push-ups." (1182, MOVE SMI)
Walking	"I [have] been walking like three, four times a weekprobably not as long as I should, but I [have] been doing it three or four times a week. But I'm trying to stretch it out, make it a bit longer." (1086, MOVE SMI)
Motivation to exercise	
Social aspect	"we all talked before [the group] and afterwards we all went outsometimes we talked and took walks." (1202, MOVE SMI) $$
Pedometer	"You look at the pedometer, like 2 o'clock in the afternoon and you only have like 5,000 [steps], this thing makes you like'Oh, I'm under 8,000 [steps].' So you start to look for likeit makes you move around instead of like sitting down." (1078, webMOVE)
Improved health outcomes	"My doctor was very impressed and I said, 'I am too!' Even though your weight went down and then up again your cholesterol and everything improved." $(1029, webMOVE)$
Weight loss	"I know that as your weight comes off, you feel good, you get more involvedyou get into clothes that you have in the closet that have been sitting there and gather dust." (1274, MOVE SMI)
Improvements in exercise due to progr	ram
Increased exercise	"The program helped me get motivated a little bit. It helped me to increase my physical activity." (1045, MOVE SMI)
Constraints on exercise	
Physical limitation/disability	"I think I'm kind of weak in exercisingbecause of my disability." (1012, webMOVE)
Mental health symptoms interference	"I have a log and that's a good thing about the program. I have a log and I can pull it out and show it to you. These are my calories, these are my carbs, this is walkingand then I didn't do anything on this day because I was depressed and you can see I was better here" (1029, webMOVE)
Increased calorie intake	"I get up and go walking, and still been walking but walking would make me hungry and I would sit down and eat a handful of crackers." (1251, webMOVE)
Role of the peer coach	
Recommendations for physical activity	"[The peer coach] was like, if you can't go out then when there is a commercial, walk in place, do something. And I thought, oh ok!" (1029, webMOVE) "I didn't know [the peer coach] was a Veteran and then it was really good[he recommended] incorporating [the bus] into an exercise thing, so I started using my pedometer and counting steps" (1248, webMOVE)

Notes. Parentheses contain participant number and treatment condition.