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Home-based Exercise among Cancer Survivors: Adherence and its Predictors

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Abstract

Objective—Evidence of the benefits of exercise for those treated for cancer has led to several exercise interventions for this population. Some have questioned whether cancer patients offered a home-based intervention adhere to the exercise prescribed.

Method—We examined exercise adherence in a randomized controlled trial of a 12-week, home-based exercise trial for breast cancer patients. Three adherence outcomes were examined: minutes of exercise participation during each week of the intervention, number of steps taken during planned exercise during each intervention week, and whether the participant met her weekly exercise goal. Predictors of adherence (e.g., demographic and medical variables, Transtheoretical Model variables, history of exercise) were examined.

Results—Findings indicate that participants significantly increased their minutes of exercise and steps taken during planned exercise from the first to the last week of the intervention. The percentage of participants achieving exercise goals was highest in the first few weeks of the intervention. Exercise self-efficacy significantly predicted each adherence outcome. Baseline PA predicted mean exercise session steps over the 12 weeks.

Conclusion—Adherence to a home-based exercise intervention for breast cancer patients changes over time and may be related to baseline levels of self-efficacy for exercise.

Keywords

Home-based exercise; adherence; cancer; oncology; breast cancer

Introduction

Evidence has supported that exercise adoption improves mood, quality of life and vigor and reduces fatigue among those treated for cancer [1–3]. In a recent review [4], we identified 33 randomized controlled trials (RCTs) of exercise participation among cancer patients and survivors; the intervention was home-based in several trials [e.g., 5,6–10]. Home-based programs are particularly subject to questions about whether participants adhere to exercise

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recommendations during the intervention in the absence of direct supervision [11]. This issue is important since adherence to exercise recommendations in RCTs is critical to the validity of the outcomes.

Exercise adherence has been defined as the degree to which a person completes a given exercise prescription and can be viewed as a continuous or as dichotomous outcome. In the former category, one can consider the total amount of exercise performed (e.g., mean minutes of exercise per week or mean pedometer steps per week) or the percentage of on-site exercise sessions attended. When viewed as a dichotomous outcome, a pre-specified threshold or goal is identified (e.g., at least 3 exercise sessions/week for at least 30 minutes each session) and the percentage of participants achieving that threshold or goal is determined. Attendance rates for on-site supervised programs for cancer patients, have been good to excellent, ranging from 77% [12] to 98% [13] and have been used as indices of program adherence. For home-based programs, where attendance at sessions is not relevant, adherence rates have ranged from 76% (percentage of participants who met the minimum criteria of 60 minutes of moderate/strenuous exercise/week) [14] to 94% (adherence to the walking goals for the intervention as reported on monthly walking logs) [8]. In this study, we examined a dichotomous measure (yes/no) of whether participants met the weekly exercise goal they had negotiated with an interventionist. This measure most accurately reflects whether participants were engaged in the PA they had agreed to perform; and is similar to an adherence measure used in a home-based exercise trial for cancer survivors [8].

We examined adherence in a home-based exercise trial for breast cancer patients. The Moving Forward (MF) trial was a RCT testing the effects of a 12-week telephone-based counseling program to promote exercise among women treated for breast cancer. The effects of the exercise intervention at post-intervention have been previously described [15]. The exercise intervention was based on the Transtheoretical Model (TTM) of behavior change [16] and Social-Cognitive Theory [17]. The potential role of TTM variables as mediators for intervention effects has been examined in a previous paper [18]. The current paper presents data on exercise behavior, collected during the 12-week intervention phase from the exercise group. Prior papers from this trial used data collected at baseline and post-intervention to analyze intervention effects and mediators [15,18] but did not focus on adherence during the intervention phase.

The primary goal of this paper was to obtain descriptive data on adherence defined both as a continuous and as a dichotomous outcome. There were two continuous measures (self-reported minutes of participation in moderate-intensity exercise and pedometer data) and one dichotomous outcome (whether or not the participant met her weekly exercise goal) of exercise adherence. The adherence measures are described in the *Assessment* section. This paper adds to the literature because it focuses on exercise behavior assessed during the intervention phase in a home-based exercise trial thereby addressing the concern of whether participants actually engaged in the behavior in the absence of on-site direct supervision.

The secondary goal was to identify predictors of adherence. The specific variables examined were demographic variables (e.g., age, education), disease/treatment variables (time since diagnosis, treatment type), TTM variables, history of previous exercise, and baseline PA. Many of these variables have been associated with exercise behavior in the general non-cancer population [19] and a few have been identified as predictors of adherence among cancer patients participating in on-site supervised exercise [20] or home-based programs [14,21]. The current paper extends and complements prior research by examining potential predictors of exercise adherence during a 12-week intervention. Identifying predictors of adherence is informative to interventionists working to increase PA participation. In addition, such data can be useful in identifying participants for whom home-based interventions would be particularly suitable.

Method

Design

The MF study was a RCT comparing a 12-week home-based moderate-intensity exercise intervention to a contact control condition. Institutional Review Boards at the Miriam Hospital and Women and Infants Hospital approved the study.

Eligibility

Women were eligible to participate if they met the following criteria: at least 18 years of age, diagnosed with Stage 0 to 2 breast cancer in the past five years, completed all surgery, chemotherapy and/or radiation, able to walk one mile without assistance, willing to be randomized, and sedentary (defined as exercising less than once/week for 20 minutes at vigorous-intensity and less than twice/week for 30 minutes at moderate-intensity for the past 6 months). Women were not eligible for the study if they had a history of another cancer (with the exception of non-melanoma skin cancer), or had a medical or psychiatric illness that would make participation in the study difficult or dangerous (e.g., cardiovascular disease). Finally, before a patient was considered eligible, written consent was required from her physician.

Recruitment

Several methods were used to recruit participants including letters sent from oncologists to their patients, in-person recruitment at oncology clinics and a private practice, and work-site mailings [22]. These efforts resulted in 424 patients being screened for the study, of which 86 were eligible, interested and enrolled. The 43 randomized to the intervention arm (Exercise Group) of the study are included in this paper. Participants in the Control Group did not receive the exercise program and no exercise adherence data were collected from them during the 12 week program; hence they are not included in this paper.

Procedure

Participants randomized to the Exercise Group in MF received a 12-week moderate-intensity exercise intervention provided by staff. Following randomization, participants were shown how to exercise at moderate intensity, monitor their heart rate, and stretch before and after exercise. Participants were given a Digiwalker pedometer (Yamax Corporation, Tokyo, Japan) to wear while exercising and logs on which to record their exercise. They were asked to exercise at moderate-intensity (that is, 55% to 65% of estimated maximum heart rate). The exercise goals were increased gradually over 12 weeks. In Week 1, the suggested goal was to walk twice/week at a brisk pace for ten minutes, and by Week 12, participants were encouraged to walk for a total of 30 minutes per day on at least five days during the week, consistent with the Surgeon General's recommendations [23].

Participants received weekly exercise counseling from research staff via telephone. The counseling was based on the Transtheoretical Model (TTM) [16] and Social-Cognitive Theory [17]. Staff reviewed the participant's activity over the past week, reinforced progress, discussed and problem-solved any barriers to exercise, and set a goal for the following week. Regarding the latter, although participants were provided with a suggested exercise goal for the week (as seen in Table 2), the interventionist asked if this goal was feasible and if it needed to be modified (increased or decreased). The rationale was that setting achievable goals would build participants' confidence. The goals that were agreed upon were not completely determined by the participant nor were goals arbitrarily pre-set/prescribed across all participants; instead they were negotiated each week to ensure success. During each call, the interventionist was required to compare the participant's reported exercise with the goals that had been negotiated, and determine if the weekly exercise goals were met. The interventionist then responded to the

question: “Did the participant meet the weekly exercise goal?” The response to this question at each call was used as a dichotomous measure of adherence. Progress toward weekly goals was documented using the weekly exercise log described above; the information recorded on the log was reported to research staff during weekly calls to monitor progress.

In addition to weekly calls, participants also received two weekly tip sheets in the mail. One tip sheet focused on a general cancer survivorship topic and the other on an exercise topic (e.g., exercising in bad weather). Finally, participants received customized feedback reports on their progress after weeks 2, 4, 8, and 12.

Research staff received 10–15 hours of training that included didactics on the intervention, and role plays to develop exercise counseling skills. Weekly calls with participants were audio-taped and reviewed for quality control. Supervision of research staff was conducted at regular intervals during intervention delivery.

Assessments

Study participants were assessed at baseline,12 (i.e., post-intervention), 24 and 36 weeks. Measures of demographic and medical information, history of moderate-intensity exercise, PA participation, motivational readiness for PA, decisional balance, and exercise self-efficacy were collected at baseline. Data on weekly exercise behavior were collected during weekly calls to the Exercise Group. During each intervention call, three measures of adherence were collected from participants—minutes of exercise participation, number of steps taken during planned exercise, and whether the participant met her weekly exercise goal. Measures are described below:

Demographic and medical information—Demographic information was provided via self-report and disease and treatment information via chart review. The demographic and medical data used in this paper include: age, education, marital status, stage of cancer, and time since diagnosis.

History of moderate-intensity exercise—At baseline, participants were asked whether they had participated in moderate aerobic exercise (i.e., “exercise that causes you to lightly perspire such as brisk walking, dancing, biking”) during adulthood (age 18 and above). Those who endorsed engaging in moderate exercise during adulthood were coded as having a moderate-intensity exercise history, while others were coded as not having such a history.

Stage of motivational readiness—This four-item measure assesses an individual's motivational readiness for exercise [24]. It has adequate reliability (kappa=.78), and concurrent validity with the 7 Day PAR [25]. The measure was revised to incorporate the guidelines on moderate-intensity exercise. Based on responses to this measure, participants were classified into the stages: precontemplation, contemplation, preparation, action, and maintenance. Regular physical exercise was defined as at least 30 minutes of moderate-intensity exercise on ≥5 days per week.

Decisional balance—A 16-item measure was used to assess decisional balance for exercise; this was a general measure and did not address cancer-specific issues related to PA. Items on this measure reflect either positive (Pro) or negative (Con) aspects of exercise adoption. Sample items include: “Regular exercise would help me relieve tension” (Pro item), and “Regular exercise would take too much of my time” (Con item). This measure is significantly associated with stage of exercise adoption in a variety of samples [26]. A positive decisional balance index (Pros minus Cons) is associated with more advanced motivational readiness for exercise.

Exercise self-efficacy—Participants' self-confidence that they could exercise in a variety of circumstances (e.g., "When I am tired.") was assessed using a five-item scale [27]. This was also a general measure and not developed specifically for cancer populations. Scores on this measure have significantly differentiated between individuals at different stages of participation in exercise [27]. Higher scores indicate a greater level of self-efficacy for exercise. Test-retest reliability of the scale is .90.

Baseline PA participation—The 7-Day Physical Activity Recall (7-Day PAR [28]), a validated, interviewer-administered measure was used to assess occupational and leisure-time PA. Participants report hours spent in sleep, moderate activity, hard activity and very hard activity. Baseline participation in moderate-intensity PA (minutes) were analyzed as a predictor of intervention adherence.

Weekly exercise logs—Participants reported the contents of their weekly exercise logs to the interventionist during weekly calls. They were asked to record the type of exercise (for a majority of participants, the chosen type of exercise was brisk walking), duration of each exercise session in minutes, heart rate and rate of perceived exertion. Data analyses were conducted only on the reported minutes of participation in at least moderate-intensity exercise (that is, exercise sessions where the participant exercised at 55–65% of estimated maximum heart rate). These values were summed, to obtain the total number of minutes of exercise participation for the week. In addition, during each weekly call the interventionist noted whether the participant met her exercise goal (yes v. no) for the week.

Pedometer readings—Participants reported the number of steps taken during each exercise session (as indicated on their pedometer); these values were summed to obtain the total number of steps taken during planned exercise during the week. When data was missing for a particular day, it was assumed that participants did not walk that day and data was imputed as a zero. This was a conservative approach for handling missing data. Thus, weekly totals were sums of the observed data.

Analyses

Descriptive data on adherence

Demographic characteristics of the Exercise Group and descriptive data for the continuous adherence measures were summarized. For each of the 12 weeks, the mean minutes of exercise and mean pedometer steps per week were reported along with the corresponding standard deviations. Weekly minutes of exercise and pedometer steps per week were calculated by adding up the minutes per day and steps per day of activity during each of the 12 weeks. Sums were calculated based on observed data. That is, in the event of missing data (e.g. participant forgot to wear the pedometer while exercising), the participant was not dropped from the analysis, but rather, total steps per week was based on the rest of her observed data. For the dichotomous outcome, the percentage of participants who met their exercise goal on a weekly basis was calculated.

For participants who dropped out prior to the 12-week assessment (4 Exercise Group participants), we used an intent-to-treat analysis and assumed that they were no longer adherent. This translates into filling in the missing dichotomous outcomes with zeros (e.g., assuming they did not meet their exercise goal). For the continuous outcomes, the conservative assumption made was that these participants did not engage in any moderate-intensity exercise during the weeks that they were no longer participating.

Predictors of adherence

To identify predictors of exercise adherence, we used Generalized Estimating Equations (GEE's) [29] to model the weekly adherence measures as a function of the potential baseline predictors. GEE's allow us to assume a correlation structure on the data, acknowledging the fact that repeated measures on the same participant will likely be correlated with one another. In this paper, we assumed a first order autoregressive correlation structure, meaning that the closer the observations are together in time, the greater the correlation. We used GEE's for both the continuous and dichotomous outcomes (with appropriate link functions in both cases).

Our modeling strategy was as follows. First, the potential predictors were used individually to model outcome and subsequently, all significant predictors were included in a single multivariate model to explain outcome. In each case, significant results are reported. Note that in using GEE's, missing data are assumed to be either missing completely at random (MCAR) or covariate-dependent missing at random (MAR-C). Since we used an intent-to-treat approach to the analysis, missing data in this case refers to any missing data on the baseline predictors. Descriptive analyses suggested that baseline minutes of PA was a skewed variable. As such, a log transformation was taken of this variable and included in the predictors model to make the variable more symmetric.

Results

Baseline characteristics of participants in the Exercise Group are summarized in Table 1.

Descriptive data on adherence

Adherence measures were recorded on the 43 participants randomized to the Exercise group. Table 2 summarizes the weekly adherence measures (mean minutes of weekly exercise, mean pedometer steps per week and percentage of participants meeting weekly exercise goal). At Week 1, participants reported an average of 43.12 minutes of exercise (SD=44.32) and at Week 12, reported a mean of 128.53 minutes/week of exercise (SD=76.82). A significant increase in mean weekly minutes of exercise was observed (t=6.93, df=42, $p<.0001$). In addition, data suggest a significant increase in mean exercise session steps per week (t=6.42, df=42, $p<.0001$) from Week 1 (Mean=4471.70, SD=5196.10) to Week 12 (Mean=14571.47, SD=9489.48). Finally, we see a larger percentage of participants reported meeting their goals earlier on in the trial period (maximum achieved during week 2) (see Table 2).

Predictors of adherence

Univariate models suggested that baseline self-efficacy was a significant positive predictor of mean minutes of weekly exercise (see Table 3). Specifically, for two women who differed in self-efficacy by 1 unit, the average difference in mean minutes of exercise during any given week was 19.46 minutes (B=19.46, SE=5.53, $p=.0004$).

When the adherence measure of interest was mean exercise session pedometer steps per week, again baseline self-efficacy significantly predicted outcome in an univariate model (see Table 4). That is, for two women who differed in self-efficacy by 1 unit, the average difference in total exercise session steps per week during any given week was 2636.91 (B=2636.91, SE=768.34, $p=.0006$). Baseline PA also was a significant predictor of this exercise adherence measure. For two women who differed in the log of baseline minutes of moderate intensity PA by 1 unit, the average difference in total exercise session steps per week during any given week was 1722.44.

For the dichotomous outcome (indicator of whether met weekly exercise goal), baseline self-efficacy was a significant predictor of achieving weekly goals (see Table 5). That is, at any

given week, there was a 61% increase in the odds of meeting the exercise goal for each 1-unit increase in self-efficacy (B=0.48, SE=0.22, OR=1.61, p=.0308). The demographic and medical variables were not significant predictors of any of the three adherence measures.

Discussion

The goals of this paper were to examine adherence data during a 12-week phone delivered exercise intervention in a RCT among breast cancer survivors and to explore predictors of adherence. The minutes of moderate-intensity exercise showed significant increases over time as expected and the objective pedometer data also increased significantly over the intervention phase. Results showed that adherence, when defined as the percentage of participants meeting their exercise goals, was fairly high in the first four weeks of the trial, declined in the middle phase of the intervention and remained lower thereafter.

It was informative to find that the percentage of participants meeting the exercise goals that had been negotiated with the interventionists showed considerable changes over time. The adherence rates were highest in Week 2 (90.7%); the lowest rates were obtained in Week 7 and Week 9 (53.9% respectively). The 12-week adherence rate averaged at 69.76%. We also examined observed data across the intervention calls (not intent-to-treat): achievement of exercise goals was met in 74% of the calls (360 out of 485 calls).

To compare our data with those reported in other home-based trials, we used the cut-off of 60 minutes of exercise/week similar to that used by Courneya and his colleagues [14]. Using the 60 minutes criterion, a goal that was suggested at Week 5 in MF, the mean adherence rate was 79.94% for Weeks 5–12. This compares favorably to the 76% adherence rates reported by Courneya and colleagues [14].

When considering adherence as a dichotomous outcome, that is, whether or not participants met their weekly exercise goals, it was surprising to note that adherence declined in the middle phase of the intervention and remained lower thereafter. These data are surprising because unlike other studies that reported adherence data [e.g., 8,21], the MF program did not “prescribe” exercise goals. Instead, in keeping with the TTM, exercise goals were suggested to participants and were re-negotiated each week so as to enable participants to set goals that were feasible for them.

It is possible that adherence (dichotomous outcome) was highest in the first four weeks of the intervention when the intervention appeared to be “novel” and the suggested exercise goals were not burdensome. With time, the novelty factor may have worn off and yet, the suggested exercise goals had increased (in Week 7, the number of suggested days of exercise were increased from 4 to 5, and the suggested total amount of weekly minutes increased by 40; a larger increase than on any other week); concurrently, there was a decrease in the proportion of participants meeting their exercise goals. Towards the final two weeks of the program, adherence rates increased but did not return to the high points observed in the first four weeks of the program. Another possibility is that the exercise goals set during the first few weeks of the program were not challenging enough and were easily met (or exceeded). These data can help inform interventionists of expected declines in adherence during a program. Interventionists can be trained to help participants prevent such decreases by techniques such as helping participants anticipate decreases in novelty effects, recognize that exercise demands increase and helping participants to overcome barriers to adherence particularly when exercise goals are increased.

Among the potential predictors of exercise adherence, baseline self-efficacy for exercise alone was a significant positive predictor for all three measures of adherence. Although exercise self-efficacy has not been examined as a predictor of adherence in other home-based trials for cancer

survivors, there is support for the positive relationship of self-efficacy and exercise in non-cancer populations [30,31]. Further, Courneya and colleagues [21] found that perceived behavioral control—a Theory of Planned Behavior construct somewhat similar to self-efficacy—predicted adherence among cancer survivors receiving a home-based exercise intervention as part of a RCT. It is important to note that our measure of self-efficacy (obtained at baseline) assessed confidence in participants' ability to remain active under a variety of circumstances (e.g., when tired) but did not specifically assess self-efficacy for meeting weekly exercise goals.

Previously, we found that baseline exercise self-efficacy was enhanced by the exercise intervention when assessed at post-intervention [18]; the current data complement these results by demonstrating that baseline self-efficacy is related to exercise adherence during the intervention phase. The expectation underlying negotiating goals during intervention calls was to facilitate goal achievement and thereby increase self-efficacy for exercise. However, the relationship between self-efficacy and goal attainment may be complex as goal attainment was not consistently high through out the 12 week intervention phase.

Decisional balance, a TTM-construct was included as a potential predictor of exercise adherence as it has been shown to be an important construct in exercise intervention trials with non-cancer populations [32,33]. However, in the current investigation, decisional balance did not predict exercise adherence; previously, we had found that it did not mediate post-intervention effects on PA [18]. It is not clear whether the limited role of decisional balance is specific to cancer survivors; a review of mediators of PA interventions did find mixed support for the role of decisional balance [34].

While exercise stage of change has been found as a predictor of adherence in trials that included cancer patients in various stages of readiness [e.g., 14,20]; in this trial, stage distribution was restricted because women in "action" or "maintenance" were very likely to report high levels of exercise at screening and were excluded from study participation. Demographic and disease-related variables were not predictive of the participants' exercise behavior. Baseline PA predicted exercise session steps but not the other adherence outcomes. Since adherence is critical to the exercise intervention dose and to intervention efficacy, it would be important to identify other potential predictors in home-based exercise trials.

The strengths of this paper lie in the testing of a theory-based intervention, the use of both self-report and objective adherence data collected during the intervention phase, the use of 12 weeks of data and low levels of attrition (5% during 12 weeks). When interpreting results, we acknowledge study limitations in that the exercise participants were a relatively small and select group of breast cancer survivors: mostly White, well-educated, and middle-to upper income strata. The sample size may indeed have limited power to detect small effects of potential predictors of exercise adherence.

To conclude, we extend the research on exercise promotion for cancer survivors by examining adherence in a home-based intervention. There is growing evidence of the potential benefits of exercise adoption among cancer survivors. Adherence during home-based trials requires close examination, even in trials that have demonstrated positive effects on exercise behavior and psychological well-being. Our data revealed positive changes over time in minutes of exercise participation and pedometer readings. There were fluctuations in the percentage of women who met exercise goals over the 12 weeks. These adherence data and the role of self-efficacy as a predictor for exercise adherence, can inform interventionists working with sedentary survivors to help them adopt exercise.

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Table 1

Characteristics of the sample

	Moving Forward Exercise Group (n=43)	
	No.	**%**
Race/ethnicity		
White	42	97.7
African American	0	0
Native American	0	0
Asian/Pacific Islander	0	0
Unknown/missing	1	2.3
Marital status		
Single/separated/divorced/widowed	7	16.3
Married/living with partner	36	83.8
Educational level		
High school/vocational/trade school	8	18.6
Some college/college degree	24	55.9
Graduate school	11	25.6
Employment status		
Employed full time	23	53.5
Employed part time	12	27.9
Retired/homemaker/medical leave	8	18.6
Household income		
≤$29,999	0	0
$30,000–$49,999	11	25.6
≥$50,000	27	62.8
Cancer stage		
0	8	18.6
1	17	39.5
2	18	41.9
Treatments		
Lumpectomy	33	76.7
Mastectomy	7	15.3
Radiation	28	65.1
Chemotherapy	24	55.8
Hormone treatment	21	48.8
Mean age (years)	53.42	
SD	9.08	
Mean years since diagnosis	1.74	
SD	1.49	
History of moderate exercise		
Yes	**36**	**83.7**

	Moving Forward Exercise Group (n=43)	
	No.	%
No	**7**	**16.3**
Stage of Motivational Readiness		
Precontemplation	**3**	**7.0**
Contemplation	**23**	**53.5**
Preparation	**17**	**39.5**
Decisional Balance		
Mean Pros	**3.74**	
SD	**0.77**	
Mean Cons	**2.07**	
SD	**0.69**	
Exercise Self-Efficacy	**2.80**	
SD	**0.91**	
Mean PA participation (minutes)	**76.12**	
SD	**86.96**	

Note: Five MF Exercise group participants did not answer the household income question.

Table 2

Exercise adherence measures over 12 weeks

	Suggested exercise	Mean minutes of exercise	Mean pedometer steps	Percent meeting goal
Week 1	20 mins	43.12 (44.32)	4471.70 (5196.10)	88.37
Week 2	30 mins.	60.09 (57.24)	6298.30 (4532.44)	90.70
Week 3	30 mins.	73.63 (69.09)	7684.40 (6781.93)	83.72
Week 4	40 mins.	77.60 (49.07)	8536.21 (5802.83)	86.05
Week 5	60 mins.	82.00 (51.84)	9603.65 (6934.29)	69.77
Week 6	60 mins.	76.67 (42.92)	8665.02 (5469.43)	72.09
Week 7	100 mins.	112.42 (68.02)	11618.70 (6335.95)	53.49
Week 8	100 mins.	104.95 (57.22)	11638.21 (7669.94)	65.12
Week 9	125 mins.	117.21 (70.70)	13317.14 (8219.19)	53.49
Week 10	125 mins.	118.05 (62.95)	13971.16 (8367.10)	58.14
Week 11	150 mins.	128.26 (70.87)	14441.26 (8594.64)	60.47
Week 12	150 mins.	128.53 (76.82)	14571.47 (9489.48)	55.81

Note: Suggested exercise represents the goals that the interventionist suggested for each week; however, these were negotiated with the participant and the final goal may have been lower/higher than the suggested goal for each week. Continuous outcomes are summarized as means (standard deviations). Dichotomous outcome is summarized as % meeting weekly goal. Summaries are based on the n=43 participants in the intent-to-treat sample.

Table 3

Predictors of mean minutes of weekly exercise: Results from univariate models

Predictor	B	SE	P
Age	0.60	0.69	0.38
Less than college education (versus at least some college)	15.23	11.73	0.19
Partnered (versus non-partnered)	−20.80	16.55	0.21
Stage of cancer (versus Stage 2)			
0	1.76	15.70	0.91
1	5.70	13.21	0.67
Time since diagnosis	6.32	3.57	0.08
No history of exercise (versus history of exercise)	−8.50	16.65	0.61
Stage of change (versus preparation)			
Precontemplation	−1.73	30.72	0.96
Contemplation	−7.88	13.04	0.55
Self-efficacy	19.46	5.53	0.004*
Decisional balance			
Pros	−0.45	8.52	0.96
Cons	−16.93	9.25	0.07
Baseline PA (minutes)	**10.00**	**6.36**	**0.12**

This table includes effects for each of the univariate models that were run. Note that each model was run separately.

Table 4

Predictors of mean pedometer steps per week: Results from univariate models

Predictor	B	SE	P
Age	91.32	95.33	0.34
Less than college education (versus at least some college)	2610.65	1507.87	0.08
Partnered (versus non-partnered)	−3454.21	2138.94	0.11
Stage of cancer (versus Stage 2)			
0	−125.83	3344.63	0.95
1	334.44	1741.35	0.85
Time since diagnosis	687.19	456.48	0.13
No history of exercise (versus history of exercise)	−1087.15	2203.24	0.62
Stage of change (versus preparation)			
Precontemplation	−626.35	3947.92	0.87
Contemplation	−1111.11	1698.49	0.51
Self-efficacy	2636.91	768.34	0.0006*
Decisional balance			
Pros	258.71	1081.77	0.81
Cons	−2446.47	1293.40	0.06
Baseline PA (minutes)	**1722.44**	**832.86**	**0.04**

This table includes effects for each of the univariate models that were run. Note that each model was run separately.

Table 5

Predictors of meeting weekly exercise goals

Predictor	B	SE	OR	P
Age	0.01	0.02	1.01	0.59
Less than college education (versus at least some college)	−0.18	0.41	0.84	0.66
Partnered (versus non-partnered)	−0.83	0.79	0.43	0.29
Stage of cancer (versus Stage 2)				
0	0.07	0.62	1.07	0.91
1	0.18	0.44	1.21	0.67
Time since diagnosis	0.17	0.15	1.19	0.26
No history of exercise (versus history of exercise)	−0.48	0.57	0.62	0.40
Stage of change (versus preparation)				
Precontemplation	−0.43	1.10	0.65	0.70
Contemplation	−0.54	0.45	0.59	0.23
Self-efficacy	0.48	0.22	1.61	0.03*
Decisional balance				
Pros	−0.19	0.29	0.83	0.51
Cons	−0.28	0.32	0.76	0.38
Baseline PA (minutes)	**0.40**	**0.31**	**1.50**	**0.19**

This table includes effects for each of the univariate models that were run. Note that each model was run separately.