

THESIS

EXPLORING CANCER SURVIVORS' PREFERENCES FOR A PHYSICAL ACTIVITY
MAINTENANCE PROGRAM

Submitted by

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ABSTRACT

EXPLORING CANCER SURVIVORS' PREFERENCES FOR A PHYSICAL ACTIVITY MAINTENANCE PROGRAM

Purpose: Physical activity (PA) offers long-term health benefits for cancer survivors (CS), if sustained. Community-based exercise programs have shown short-term effectiveness in increasing PA among cancer survivors, but evidence of their effect on long-term PA engagement (i.e., PA maintenance) is lacking. This study (1) quantitatively explored cancer survivors' preferences for a PA maintenance program and whether preferences were impacted by PA levels, and (2) qualitatively explored participants' preferences of a PA maintenance program and PA-related barriers. **Methods:** CS who completed one of three original cancer-specific community-based exercise programs participated in a pilot PA maintenance program (i.e., two exercise and discussion sessions). (1) Participants completed questionnaires via REDCap database to assess interest in a PA maintenance program (i.e., likelihood of attending, perceived helpfulness and enjoyment, and preferences of frequency, duration, and time until maintenance program commencement) and PA levels. Participants reported current PA levels compared to when they finished the original program (greater or same vs. lower PA levels) and completed the Godin Leisure-Time Exercise Questionnaire to determine whether they were currently meeting PA guidelines (≥ 150 mins/week of moderate aerobic PA + 2 days of strength training). (2) Participants also completed semi-structured focus groups via Zoom that aimed to answer the following questions regarding participants': (i) maintenance program experience, (ii) suggestions for future maintenance program implementation, (iii) perceived elements of the original program

that were helpful in maintaining PA, and (iv) barriers experienced following the original program. Frequencies from (1) were calculated, and Fisher's exact tests were used to compare proportions between maintenance program preferences and participants' PA levels. Qualitative data from (2) were transcribed verbatim, coded inductively, and analyzed using thematic analysis. Themes and frequencies of references (%) were calculated. Results: (1) Participants ($N=20$) were $M=60\pm 13$ years old, non-Hispanic White (95%), female (95%), and diagnosed with breast (50%), ovarian (20%), or other (30%) cancer. Average time since program completion was $M=26.2 \pm 35.7$ (1-110) months. Most participants (65%) reported exercising more or the same amount since original program completion, and 35% met PA guidelines. The majority were likely to attend maintenance exercise (90%) and discussion (80%) sessions. All (100%) participants thought maintenance exercise sessions would be helpful and most (85%) for discussion sessions. There were no differences in responses based on PA levels (all $p>.05$). (2) Themes identified for (i) were Accountability (36%), Shared Cancer Survivor Experience (26%), Individualized Exercise Prescription (30%), and Discussion Session Content (8%); (ii) were Accountability (8.929%), Discussion Session Content (26.79%), and Discussion (19.64%) and Exercise (44.64%) Session Delivery; (iii) were Accountability (39.39%), Individualized Exercise Prescription (30.3%), and Discussion Session Content (30.3%); and (iv) were Psychological (41.38%), Physical (27.59%), and Environmental (31.03%). Conclusion: Participants had positive perceptions of the maintenance program. Future studies should measure effectiveness of a maintenance program to support PA maintenance and encompass program leader perspectives to work towards achieving pragmatic solutions to maintain PA maintenance programs within community-based settings.

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1. INTRODUCTION

Physical activity (PA) can provide many long-term health benefits including improved physical function, fatigue, anxiety, depressive symptoms, and health-related quality of life (QOL) for individuals living with a cancer diagnosis (i.e., cancer survivors) (Campbell et al., 2019), as well as reductions in cancer-specific morbidity and mortality (McTiernan et al., 2019). Unfortunately, recent estimates conclude that only 14.8 percent of cancer survivors that are 18 years or older are meeting federal guidelines for aerobic and muscle-strengthening physical activity (Cancer Survivors and Physical Activity | Cancer Trends Progress Report, n.d.). Failure to meet physical activity guidelines may mean that cancer survivors will not experience the myriad of benefits that result from engaging in physical activity.

Cancer-specific community-based exercise programs are effective for helping cancer survivors increase PA. One study of participants in LIVESTRONG at the YMCA found that cancer survivors' PA levels significantly increased following program completion when compared to a control group (Irwin et al., 2017). These findings are congruent with other community-based programs which have demonstrated increased weekly minutes of moderate and vigorous PA from pre- to post-program (Grimmett et al., 2019; Mina et al., 2017; Spector et al., 2012; Wood et al., 2022). Although to date many cancer-specific community-based exercise programs have demonstrated short-term effectiveness for increasing PA among cancer survivors, evidence to support long-term engagement in PA (i.e., PA maintenance), and how to do so within the context of community-based settings, is lacking (Jankowski et al., 2014; McNeely et al., 2019; Turner et al., 2018).

In order to address PA maintenance following community-based exercise programs, it is important to consider the multitude of factors that might help or impede cancer survivors' ability to sustain PA increases attained during the program. Previously reported determinants of PA maintenance in non-cancer survivors include positive intentions/goals and higher self-efficacy (Amireault et al., 2013), as well as higher levels of motivation (Nigg et al., 2008). Other evidence from intervention literature suggests that print and technology-based resources may be sufficient for supporting PA maintenance in a non-cancer population (Marcus et al., 2021). In cancer survivors, peer support, knowledgeable instructors and a supportive social environment have been reported as determinants of exercise maintenance (Ranes et al., 2022). However, another study suggests that there is no particular type of intervention needed for cancer survivors, rather having a cost-effective option (e.g., home-based) is most important (Irwin, 2009). One systematic review and meta-analysis found that interventions for cancer survivors that were ineffective at supporting PA maintenance, as defined by 3-months follow-up, included older populations with existing physical limitations, had less contact with participants, were unsupervised, or did not include behavior change techniques of 'action planning', 'graded tasks' or 'social support' (Grimmett et al., 2019). However, a systematic review reporting determinants of PA maintenance following exercise interventions among cancer survivors found insufficient evidence to make conclusions on determinants of PA maintenance after an intervention (Kampshoff et al., 2014).

While these data are informative, they lack consistency and do not capture information needed to guide community-based programs in what they can do and/or the support they can provide to encourage PA maintenance among participants. For example, previous studies that examined determinants of PA following the completion of a community-based exercise program

for cancer survivors identified both individual (e.g., fatigue, competing time commitments) and organizational (e.g., YMCA membership fee) barriers to maintaining PA months after completing the program 11/7/2023 4:52:00 PM; Lee et al., 2016).

It is clear that promoting PA maintenance for cancer survivors in the context of a community-based program is a complex, multilevel process (i.e., individual and organizational considerations). There are many gaps in the literature regarding how to best support survivors' PA following participation in a community-based exercise program, and effective methods of integrating support into the infrastructure of an existing program. Given this complexity, a deeper understanding of cancer survivors' preferences for how cancer-specific community-based exercise programs can assist PA maintenance is needed.

To achieve this deeper understanding of cancer survivors' preferences for PA maintenance support from a community-based exercise program, qualitative research methods may be needed to compliment quantitative data (Thirsk & Clark, 2017). Of the studies mentioned above which examined PA maintenance following community-based programs (Cheifetz et al., 2015; Lee et al., 2016), neither used a qualitative, or mixed methods, approach. Thus, to ensure that the complex, multi-level factors that may influence PA following a community-based exercise program are captured, a qualitative approach may provide additional in-depth information regarding individuals' perceptions relevant to their contexts (i.e., features of a specific program) (Cooper et al., 2021).

In summary, although community-based exercise programs can increase cancer survivors' PA, there is a lack of understanding of how-to best design and implement a PA maintenance program that is compatible with survivors' preferences, wants, and needs. Therefore, the primary aim of this study was to examine cancer survivors' preferences for a PA

maintenance program, along with whether these preferences varied based on participants' PA levels. The secondary aim was to qualitatively explore participants' preferences of a PA maintenance program, along with barriers and facilitators they have experienced to maintaining PA following participation in a community-based exercise oncology program.

activity or should only engage in a medically supervised physical activity/exercise program (as indicated by PARmed-X screening tool). Each community-based exercise program leader-initiated recruitment via email, and participants were enrolled from May 2022 to July 2022. Inclusion/Exclusion criteria were the same for the current study.

2.3 Study Procedures

Participants completed two pilot PA maintenance sessions following the completion of one of three original community-based exercise programs (i.e., Surviving and Thriving After Cancer (STAC), Fit Cancer, or LIVESTRONG at the YMCA) at any point in time. Questionnaires and focus groups were completed after participating in both pilot maintenance sessions. Each original community-based program included supervised, group-based aerobic and resistance exercise for any cancer type. Program duration ranged from 6- (STAC), 8- (Fit Cancer), and 12-weeks (LIVESTRONG) long. STAC and LIVESTRONG were offered exclusively in-person in a hospital-based outpatient rehabilitation center and a YMCA fitness center, respectively. The Fit Cancer program was delivered in real time via Zoom videoconferencing software. STAC offered education discussion sessions during the original program, LIVESTRONG offered informal, non-guided discussion sessions, and Fit Cancer offered guided Social Cognitive Theory-based discussion sessions every other week during the program. The Fit Cancer program participants were also given Fitbits devices to use throughout the original community-based program and keep following its completion.

2.3.1 PA Maintenance Exercise and Discussion Sessions

Each maintenance session consisted of a 60-minute exercise session immediately followed by a 45-minute guided PA behavior change discussion session. Maintenance sessions were delivered either face-to-face at each community site or via Zoom videoconferencing software. The delivery modality (i.e., face-to-face versus via Zoom) was determined by each site's fitness professional prior to the start of the maintenance sessions. Each maintenance session was group-based and delivered by staff with a minimum of a bachelor's degree in exercise science or kinesiology along with training in exercise oncology and PA behavior change theories and techniques. Participants were eligible to receive up to \$170 in compensation throughout the R21 phase (i.e., \$30 after completing each exercise session, \$30 after completing each discussion session, and \$50 for completing the focus group). Each program's maintenance sessions were completed within a 2–3-week time frame.

The exercise sessions mirrored the format of each participant's original community-based program. Generally, the format of each exercise session entailed a 5-10 minute aerobic and dynamic stretching warm-up, followed by 15-20 minutes of aerobic exercise, 25-30 minutes of resistance exercise, and concluded with a 5-minute static stretching cool down. Both Fit Cancer groups provide an exception to this format, as aerobic and resistance exercises were integrated throughout the duration of the 60-minute exercise session. Other key differences such as delivery modality and exercise equipment utilized by each program can be found in sections 2.3.2 – 2.3.4.

Discussion sessions were loosely scripted using a discussion booklet that was given to all participants and was created by the study team. Behavior change discussion material was guided by the Social Cognitive Theory (SCT), a theoretical framework that has demonstrated meaningful impacts on PA behavior change in cancer survivors (Stacey et al., 2015). SCT suggests that self-efficacy is a key determinant of behavior (Bandura, 1986). Discussion booklets

targeted facilitators of PA self-efficacy such as mastery of experiences, social support, and self-regulatory skills (e.g., self-monitoring devices and strategies for overcoming barriers). All discussion sessions were guided by the study's staff member who also delivered each exercise session. The discussion session delivery modality used by each site is detailed in sections 2.3.2 – 2.3.4.

2.3.2 Surviving and Thriving After Cancer (STAC)

STAC was the only program that delivered one maintenance session face-to-face and the other via Zoom videoconferencing software. During the in-person session, participants were able to select their choice of aerobic exercise equipment (i.e., treadmill, elliptical, stationary bike, or NuStep®). Aerobic exercise was performed in time intervals, where participants self-selected low-, moderate-, and high-intensity levels and completed a time interval at each intensity level in ascending order (low to high) followed by descending order (high to low). All resistance exercises were chair-based, using a series of participant-selected TheraBands that varied in degree of resistance (i.e., intensity). Resistance exercises were circuit-based where participants completed 3 rounds of 5 exercises (e.g., banded sit-to-stand, reverse chair crunches, etc.) and were instructed to complete as many repetitions as possible in the designated time frame. A detailed example of STAC's in-person workout can be found in Appendix A.

STAC's virtual maintenance session was help in real-time and resembled the in-person workout as closely as possible. Since aerobic equipment was not available at each participant's home, aerobic movements (e.g., side steps, marching, etc.) were selected and the intensity level of these movements were manipulated to simulate the change from light to moderate and moderate to high intensity that was completed in the face-to-face session. Intensity levels were manipulated by adding more muscle groups and/or changing the speed of the movement.

Participants completed the same chair-based resistance training workout that was completed in the face-to-face maintenance session with the same resistance bands, number of rounds, exercises, and time intervals.

2.3.3 Fit Cancer

All Fit Cancer maintenance sessions were delivered virtually, in real-time, using Zoom videoconferencing software. A series of circuit-based resistance band and body weight exercises that were used in the original Fit Cancer program were selected for use in the maintenance program. Since the original Fit Cancer program is delivered virtually, all participants had the same set of resistance bands. As previously mentioned, aerobic and resistance exercises were integrated throughout the 60-minute exercise session, rather than performing each type of exercise separately. An example of a detailed version of the Fit Cancer workouts can be found in Appendix A.

2.3.4 LIVESTRONG at the YMCA

Both LIVESTRONG maintenance sessions were delivered face-to-face. Aerobic and resistance exercises were machine-based. Participants completed steady state cardio at a self-selected intensity on any of the available cardio machines (i.e., treadmill, elliptical, stationary bike, or NuStep®). A total of 5 machine-based exercises (e.g., seated leg press, lat pull down, etc.) were performed by each participant for 3 rounds, 8 repetitions per round. An in-depth version of the LIVESTRONG exercise sessions can be found in Appendix A.

2.4 Aim 1 (Quantitative) Measures

Demographics, health history, and physical activity level questionnaires were administered prior to the commencement of the maintenance program. The remaining measures were completed following the maintenance program when participants were asked to provide feedback regarding their experiences completing the pilot maintenance sessions.

2.4.1 Demographics and Health History

Prior to the commencement of the maintenance sessions, a series of questionnaires were delivered online via REDCap database and included a demographics and medical and health history questionnaire.

2.4.2 Physical Activity Levels

Current, self-reported physical activity levels were measured with a modified version of the Godin Leisure-Time Exercise Questionnaire (GLTEQ), a validated and widely used questionnaire amongst exercise oncology research (Amireault et al., 2015). The GLTEQ captured frequency (days/week) and duration (minutes/session) of aerobic exercise at light, moderate, and vigorous intensity levels within a typical week (7-days) over the previous month. Frequency and duration of strength training were also measured. Exercise sessions had to last 10 minutes and be completed during participants' free time (i.e., not occupation or housework) to be considered suitable to report. The following equation was used to calculate weekly minutes of moderate-to-vigorous physical activity (MVPA):

$$([Days\ of\ moderate\ PA] \times [Minutes\ of\ moderate\ PA] + [Days\ of\ vigorous] \times [Minutes\ of\ vigorous] \times 2)$$

Data from the GLTEQ were used to determine whether participants were meeting PA guidelines, as defined as ≥ 150 minutes of moderate-intensity aerobic exercise and 2 days of muscle strengthening activity.

In attempt to understand participants' exercise levels in relation to those following their original program, an additional section was added to the questionnaire. Participants reported their current exercise levels in comparison to when they finished the original program. Responses were a spectrum of multiple-choice options where participants selected that they currently exercise “*a lot less*”, “*a little bit less*”, “*about the same*”, “*a little bit more*”, or “*much more*” than when they completed the original program.

2.4.3 Feasibility and Acceptability

The feasibility and acceptability questionnaire encapsulated participants' satisfaction of the maintenance sessions (i.e., exercise and discussion sessions, separately) following their conclusion. Questions such as, “*Did you enjoy the maintenance (exercise/discussion) session?*” and “*If you were offered (exercise/discussion) sessions like these after completing Fit Cancer, STAC, or LIVESTRONG, what is your likelihood to attend these sessions?*” were presented. All questions provided 5 multiple-choice response options such as, “*Definitely no, somewhat no, indifferent, somewhat yes, or definitely yes*” and “*Very likely, somewhat likely, indifferent, somewhat unlikely, or very unlikely*”, respectively. The feasibility and acceptability questionnaire can be found in Appendix B.

2.5 Aim 2 (Qualitative) Measures

2.5.1 Focus Groups

To further explore the feasibility and acceptability of the maintenance sessions, participants were invited to take part in focus groups delivered via Zoom videoconferencing software. All focus groups were semi-structured and addressed the following questions, (1) What was the acceptability of example or “pilot” PA maintenance program components? (2) What were the participants’ suggestions for future implementation of these maintenance sessions? (3) What were elements of the original community-based program that helped participants sustain PA? and (4) What barriers did participants experience following their original community-based program? Each focus group contained 3-6 participants and were conducted by the study coordinator who was trained in qualitative research methods and accompanied by a graduate student observer who was instructed to take detailed notes of data that would not be discernible in the focus group transcript (e.g., strong intonation, facial expressions, etc.). The individual who delivered the pilot maintenance sessions was not involved in the collection of qualitative data. Duration of focus groups were approximately 45 minutes. One focus group was completed at each site, apart from Fit Cancer that conducted two focus groups because of the large sample derived from this program. In total, 4 focus groups were completed (STAC, LIVESTRONG, Fit Cancer group 1, and Fit Cancer group 2).

Generally, focus group questions addressed participants’ perceptions of the maintenance sessions and barriers experienced following the completion of their community-based program. A list of specific questions addressed in each focus group can be found in Appendix C. STAC addressed additional questions related to the perceptions of delivery format (i.e., face-to-face versus virtually).

One LIVESTRONG participant was not able to attend their focus group. This participant completed an interview, using the same semi-structured focus group protocol (Appendix C), with the study coordinator. Given the explorative nature of this study and the goal of understanding cancer survivors' preferences for a PA maintenance program, along with barriers experienced following a community-based exercise oncology program, data derived from the interview was included with the focus group data, despite differing collection modalities.

2.6 Data Analyses

2.6.1 Aim 1 (Quantitative)

Quantitative data were analyzed using Statistical Package for the Social Sciences (SPSS) software version 28.0.1.1. Descriptive statistics ($M \pm SD$) were used to present participant characteristics and frequencies (n, %) were used to explore participants' feedback regarding the maintenance program. Participant responses to exercise levels in comparison to when they finished the original program were collapsed into two categories: "*Greater or same PA levels*" or "*Lower PA levels*". Responses to the feasibility and acceptability questionnaire were also collapsed to binary response options. Binary response options can be found in Table 2 in the results section. Fisher's exact tests were used to compare maintenance program preferences between participants' PA levels. Statistical significance was set at $p < 0.05$. Maintenance program preferences included time to maintenance program commencement following original program completion, frequency of maintenance sessions, and maintenance program duration. Preferences were explored based on participants' PA levels since original program and whether they were meeting PA guidelines.

2.6.2 Aim 2 (*Qualitative*)

Audio recordings from the focus groups and interview were transcribed verbatim on Zoom and transferred to a Microsoft word document by EL. Feedback provided from graduate student observers during each focus group was integrated with the transcripts. HA then read through each transcript once for familiarization and a second time to revise for precision. Each transcript was uploaded to NVivo version 1.7.1, a qualitative data management and coding software, and evaluated using thematic analysis. Transcripts were coded independently by two researchers (HA and EL). Data was coded using an inductive coding approach, which included the application of codes to describe the data. This approach can be used for, “meaning-making, developing findings, and evidence generating” purposes without preconceived theories guiding the analyzation process (Vanover et al., 2021). To certify inter-rater reliability, HA and EL compared codes and revised discrepancies between codes. All discrepancies were resolved over a discussion between HA and EL. In efforts to answer each of the four focus group questions separately, codes were categorized by question.

A third qualitative researcher, MC, was brought on in May of 2023 to help finish analysis. MC was well versed on the study and reviewed each transcript prior to analysis to ensure familiarity with the data. Then, HA and MC independently discovered patterns within the codes and developed themes to answer each focus group question. Themes were compared over discussion, and no discrepancies occurred. Themes along with participant quotes were extracted from the transcripts to exemplify direct feedback that was received. Participant identifiers were not included to protect privacy. Frequencies of each theme were calculated and are characterized by the number of times each theme was referenced, rather than the number of participants who referenced the theme.

3. RESULTS

A total of N=20 participants completed quantitative surveys and N=19 completed the focus groups. Of the 20 participants, n=12 (60%) participated in Fit Cancer, n=5 (25%) participated in LIVESTRONG, and n=3 (15%) participated in STAC. Due to the higher quantity of participants coming from the Fit Cancer program, the 12 participants were split evenly into two separate groups to complete the maintenance program (i.e., n=6 per group). Participants were on average 61 ± 13 (24 – 80) years old and completed their original community-based program 26 ± 36 months (1 – 110 months) prior to the maintenance program. Most participants were female (95%) and diagnosed with breast (50%), ovarian (20%), or other (30%) cancer. Participant characteristics can be found in Table 1.

Table 1. Participant Characteristics (N = 20).

	Mean \pm SD
Age (years)	60.5 \pm 13.1
Time since original program completion (months)	26.2 \pm 35.7
Aerobic MVPA (min/week)	162.8 \pm 206.2
Strength (days/week)	1.4 \pm 1.4
	n(%)
Community-Based Program	
Fit Cancer	12(60)
LIVESTRONG	5(25)
STAC	3(15)
Sex	
Male	1(5)
Female	19(95)
Race	
American Indian or Alaska Native	1(5)
Asian	1(5)
White	18(90)

Ethnicity	
Hispanic or Latino	1(5)
Not Hispanic or Latino	19(95)
Education	
Some college	6(30)
College graduate	7(35)
Graduate school	7(35)
Combined family income	
Less than \$20,000	1(5)
\$20 – 49,000	6(30)
\$50 – 99,000	4(20)
\$100 – 149,000	2(10)
More than \$150,000	5(25)
Don't know or chose not to answer	2(10)
Cancer diagnosis	
Breast	10(50)
Ovarian	4(20)
Multiple Myeloma	2(10)
Appendiceal	1(5)
Colon	1(5)
Endometrial	1(5)
Non-Hodgkin's lymphoma	1(5)
On treatment during maintenance program	
Yes	3(15)
No	17(85)
Meeting PA Guidelines	
	7(35)
Current exercise levels in comparison to exercise level following the completion of the original program	
A lot less	3(15)
A little bit less	4(20)
About the same amount	3(15)
A little bit more	7(35)
Much more	3(15)

MVPA= moderate to vigorous physical activity.

3.1 Aim 1 (Quantitative) Results

Overall, participants' perceptions of the PA maintenance program components were positive. Frequencies of participant responses to the feasibility and acceptability questionnaire can be found in Table 2, and differences in maintenance program preferences between PA level measures can be found in Table 3. All participants (n=20, 100%) enjoyed the maintenance

exercise sessions, and the majority (n=15, 75%) enjoyed the maintenance discussion sessions. All participants (n=20, 100%) also reported that the maintenance exercise sessions would be a helpful tool to maintain or increase PA/exercise levels following the completion of the original community-based program. Most participants (n=17, 85%) also found the maintenance discussion sessions helpful (see Table 2). There was no significant difference found in enjoyment of the maintenance discussions sessions based on meeting PA guidelines (p= 1.00) or PA levels since original community-based program completion (p=0.29) (Figure 2). Similarly, no significant difference was found in the perceived helpfulness of the discussion sessions based on meeting PA guidelines (p=0.27) or PA levels following original community-based program completion (p=1.00) (see Figure 3). Since all participants found the exercise sessions enjoyable and helpful, differences in responses based on PA level measurements were not examined. Frequencies of reported enjoyment and helpfulness of the maintenance exercise sessions based on PA levels can be found in figures 4 and 5, respectively.

Table 2. Aim 1 Feasibility and Acceptability Questionnaire Frequencies. Enjoyment and helpfulness of maintenance exercise sessions could not be computed.

Question	Answers	Exercise n (%)	Discussion n (%)
Did you enjoy the maintenance [exercise/discussion] sessions?	Did not enjoy or Indifferent	0 (0)	5 (25)
	Did enjoy	20 (100)	15 (75)
Do you feel that attending [exercise/discussion] sessions like these, after completing an exercise program like	Not Helpful or Indifferent	0 (0)	3 (15)

[STAC/Fit Cancer/LIVESTRONG] would help someone maintain or continue to increase activity or exercise levels?		Helpful	20 (100)	17 (85)
If you were offered [exercise/discussion] sessions like these after completing [STAC/Fit Cancer/LIVESTRONG], what is your likelihood to attend these sessions?		Likely	18 (90)	16 (80)
		Unlikely or Indifferent	2 (10)	4 (20)
Question	Answers	Exercise n (%)	Answers	Discussion n (%)
If you were offered a maintenance program after participating in [STAC/Fit Cancer/LIVESTRONG], how often would you have wanted to attend [exercise/discussion] sessions?	1x/week	13 (65)	2 or More Times per Month	6 (30)
	>1x/week	7 (35)	1 or Less Times per Month	14 (70)
Question	Answers	n (%)		
If you were offered a maintenance program after participating in [STAC/Fit Cancer/LIVESTRONG], how long would you consider attending the maintenance program?	6 or less months	7 (35)		
	≥1 year or indefinitely	13 (65)		
If you were offered a maintenance program after participating in [STAC/Fit Cancer/LIVESTRONG], how long after completing the program would you want the maintenance program to commence?	Immediately or within 1 month	13 (65)		
	Longer than 1 month	7 (35)		

Table 3. Comparison of PA Maintenance Program Preferences by PA Level. Statistical significance was set at $p < 0.05$. Responses for Enjoyment and helpfulness of maintenance exercise sessions are not presented because all 100% of participants reported yes to each question.

		Meeting PA Guidelines n (%)	Not Meeting PA Guidelines n (%)	p-value	Greater or Same PA Levels Since Original Program Completion n (%)	Lower PA Levels Since Original Program Completion n (%)	p-value
Perceptions of Maintenance Exercise Sessions	Enjoyed	7 (35)	13 (65)	---	13 (65)	7 (35)	---
	Helpful	7 (35)	13 (65)	---	13 (65)	7 (35)	---
	Likely to attend	7 (35)	11 (55)	.521	11 (55)	7 (35)	.521
	Unlikely/Indifferent	0 (0)	2 (10)		2 (10)	0 (0)	
Perceptions of Maintenance Discussion Sessions	Enjoyed	5 (25)	10 (50)	1.000	11 (55)	4 (20)	.290
	Did not enjoy/Indifferent	2 (10)	3 (15)		2 (10)	3 (15)	
	Helpful	5 (25)	12 (60)	.270	11 (55)	6 (30)	1.000
	Not helpful/Indifferent	2 (10)	1 (5)		2 (10)	1 (5)	
	Likely to attend	5 (25)	11 (55)	.587	11 (55)	5 (25)	.587
	Unlikely/Indifferent	2 (10)	2 (10)		2 (10)	2 (10)	
Maintenance Program (i.e., exercise + discussion sessions) Preferences	Frequency of Exercise Sessions: 1x/week	4 (20)	9 (45)	.651	9 (45)	4 (20)	.651
	Frequency of Exercise Sessions: >1x/week	3 (15)	4 (20)		4 (20)	3 (15)	
	Frequency of Discussion	6 (30)	8 (40)	.354	9 (45)	5 (25)	1.000

Sessions: ≤1x/month					
Frequency of Discussion Sessions: ≥2x/month	1 (5)	5 (25)		4 (20)	2 (10)
Duration: ≤6 months	1 (5)	6 (30)	.329	5 (25)	2 (10)
Duration: ≥1 year	6 (30)	7 (35)		8 (40)	5 (25)
Commencement : ≤1 month	4 (20)	9 (45)	.651	7 (35)	6 (30)
Commencement : >1 month	3 (15)	4 (20)		6 (30)	1 (5)

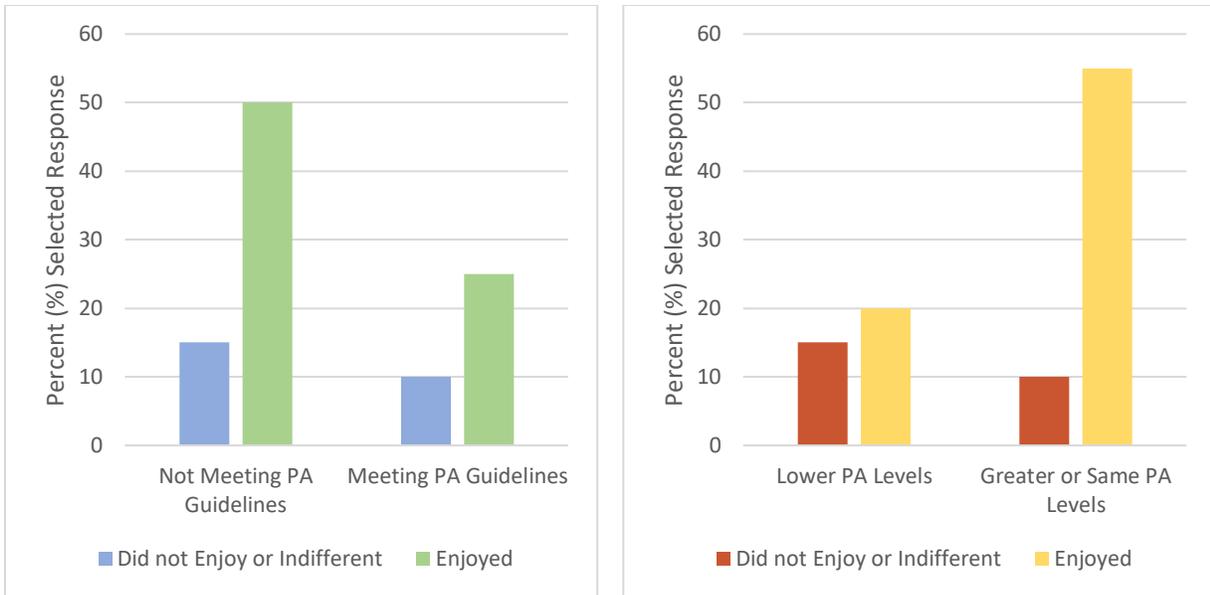


Figure 2. Maintenance Discussion Sessions: Reported Enjoyment Based on PA Levels.

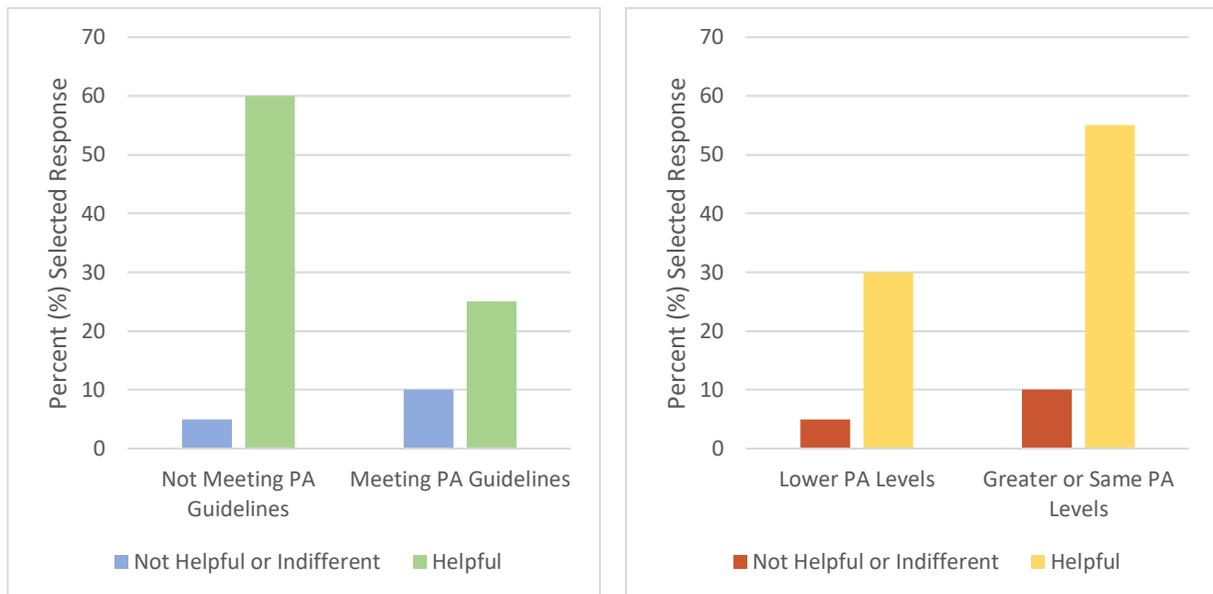


Figure 3. Maintenance Discussion Sessions: Reported Helpfulness Based on PA Levels.

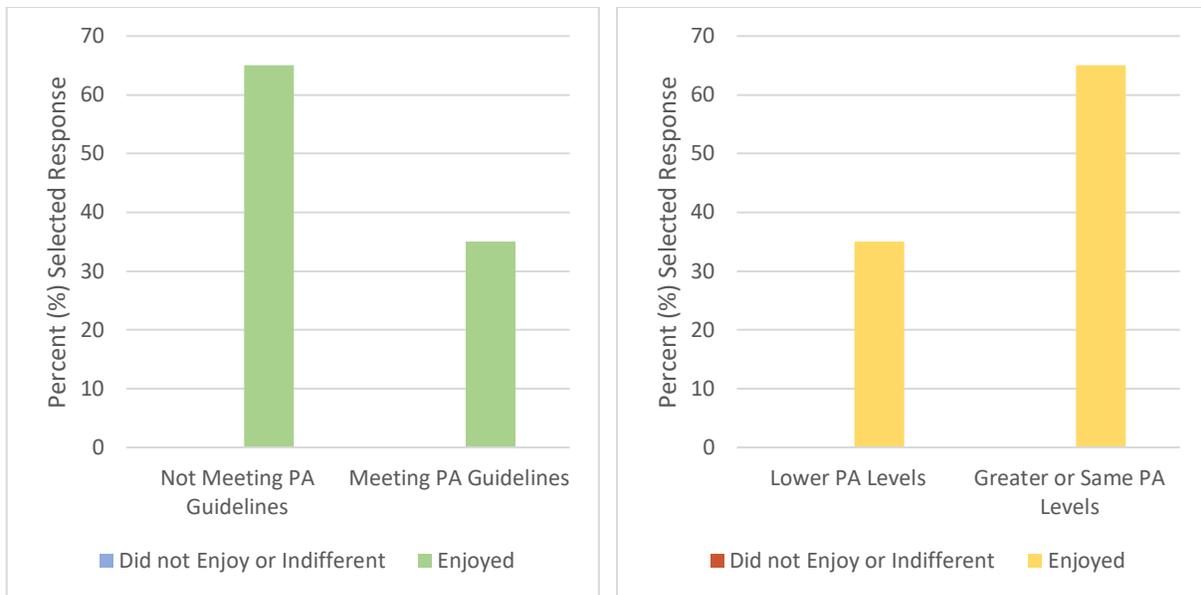


Figure 4. Maintenance Exercise Sessions: Reported Enjoyment Based on PA Levels.

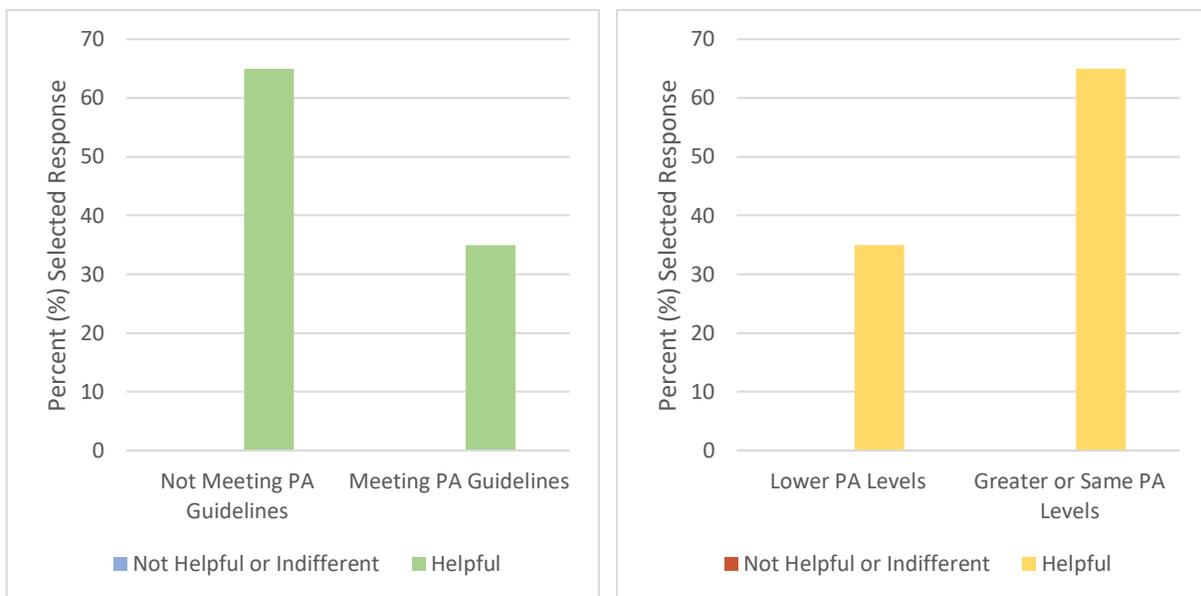


Figure 5. Maintenance Exercise Sessions: Reported Helpfulness Based on PA Levels.

The majority of participants reported being likely to attend maintenance exercise (n=18, 90%) and discussion (n=16, 80%) sessions. There were no significant differences in likelihood of maintenance exercise or discussion session attendance based on meeting PA guidelines (p= 0.52 and p=0.59, respectively) or PA levels since the original community-based program (p=0.52 and p=0.59, respectively) (see Figures 6 and 7).

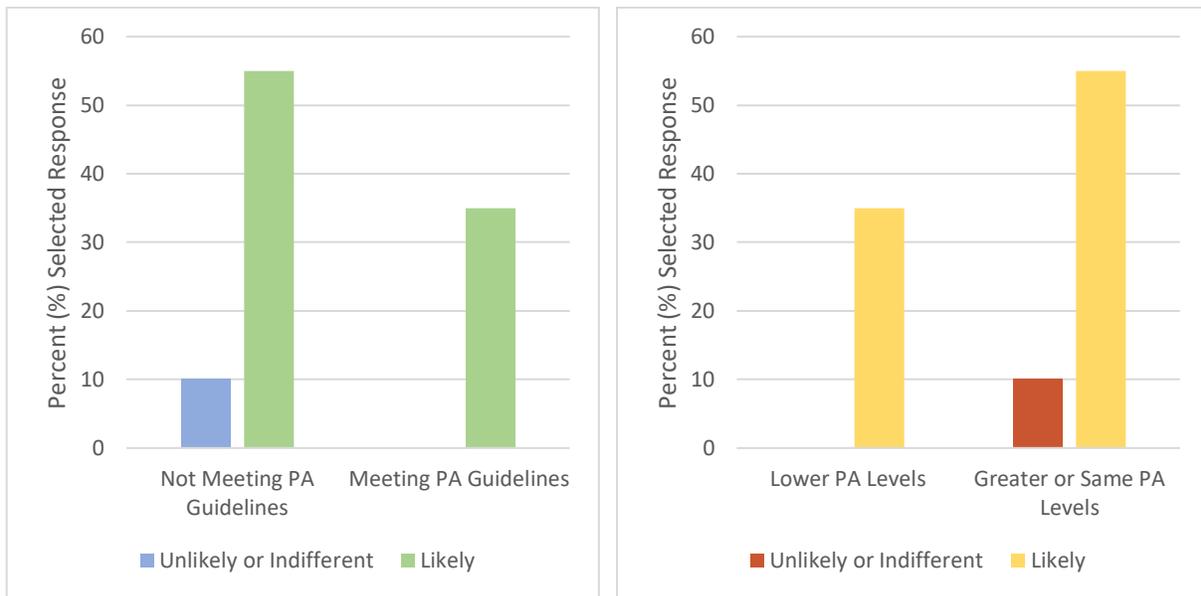


Figure 6. Maintenance Exercise Sessions: Reported Likelihood of Attending Based on PA Levels.

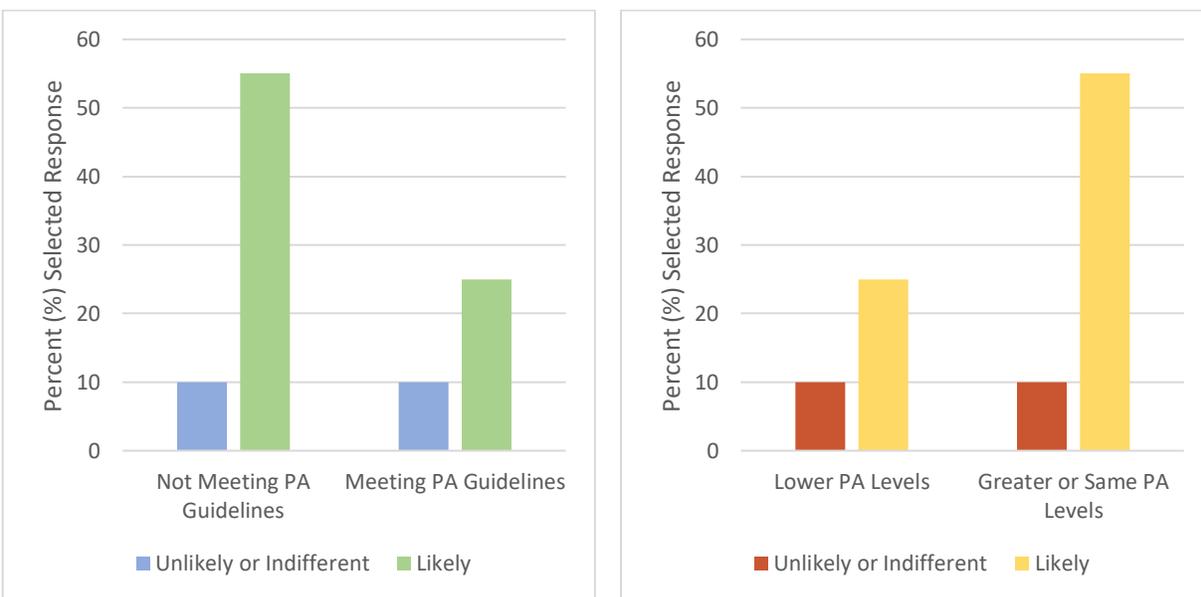


Figure 7. Maintenance Discussion Sessions: Reported Likelihood of Attending Based on PA Levels.

Regarding maintenance program components, most participants would prefer having maintenance exercise sessions be offered once per week (n=13, 65%) while discussion sessions be offered 1 or less times per month (n=14, 70%). Responses to how long participants would consider attending a maintenance program varied, with most (n=13, 65%) selecting 1 year or

longer. Majority of participants reported wanting the maintenance program to start immediately, or within 1 month (n=13, 65%) of the conclusion of the original community-based program. Whether or not participants were meeting PA guidelines had no significant effect on maintenance program preferences including frequency of exercise (p=0.65) or discussion (p=0.35) sessions, maintenance program duration (p=0.33), or time until maintenance program commencement (p=0.65). Correspondingly, PA levels since original community-based program completion had no significant effects on preferences of frequency of exercise (p=0.65) or discussion (p=1.00) sessions, maintenance program duration (p=1.00), or time until maintenance program commencement (p=0.33). See figures 8– 11.

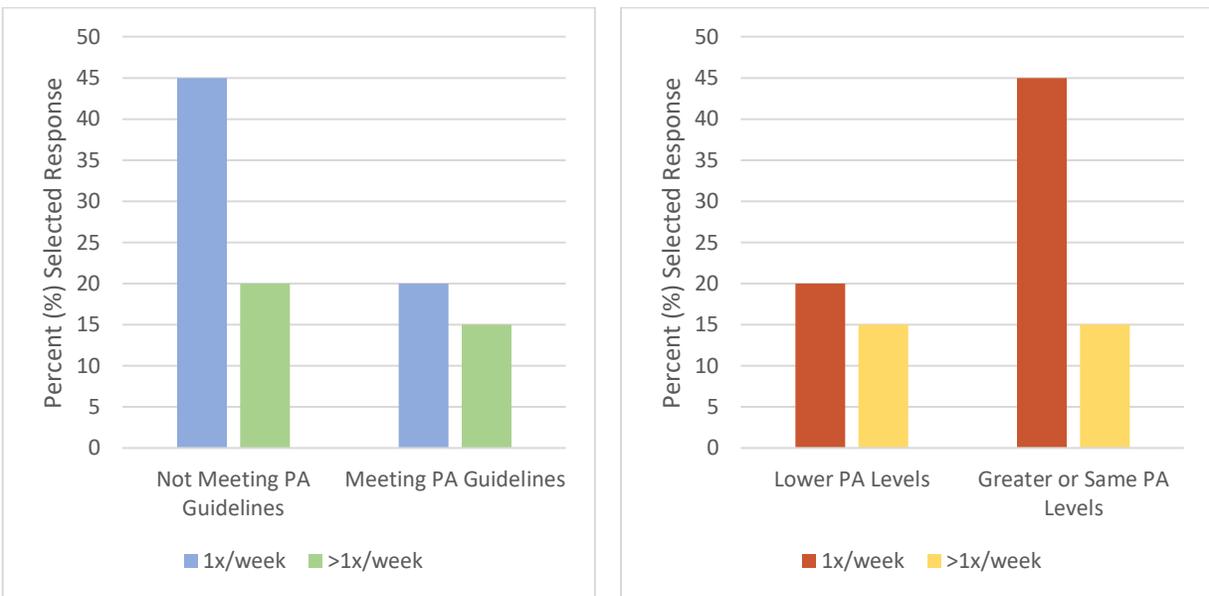


Figure 8. Maintenance Exercise Sessions: Preference of Frequency Based on PA Levels.

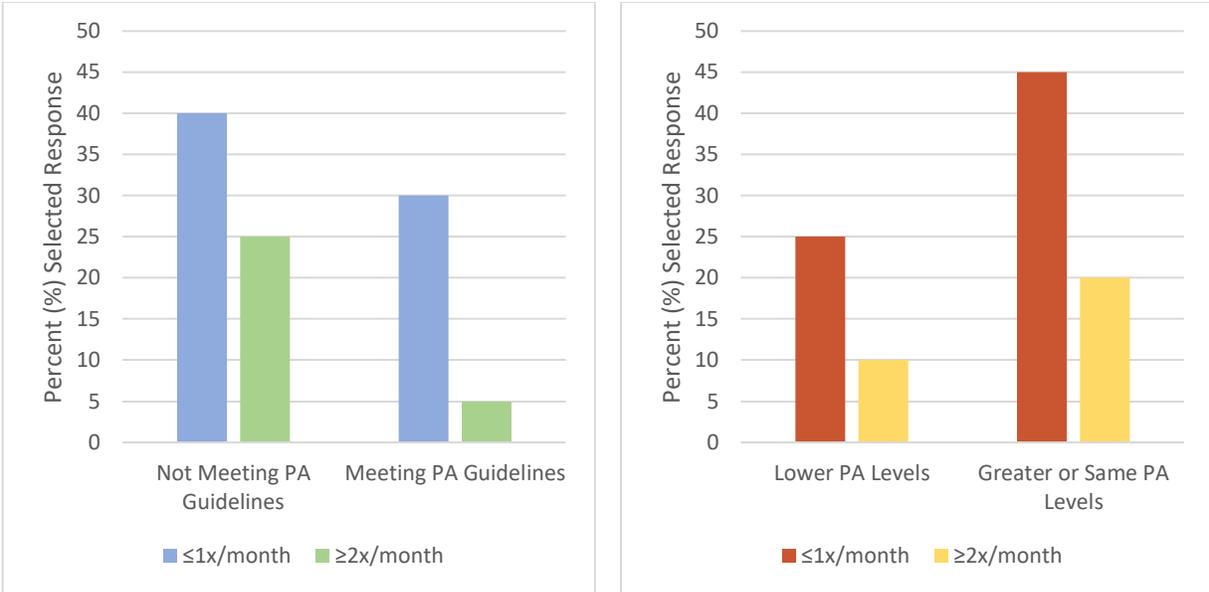


Figure 9. Maintenance Discussion Sessions: Preference of Frequency Based on PA Levels.

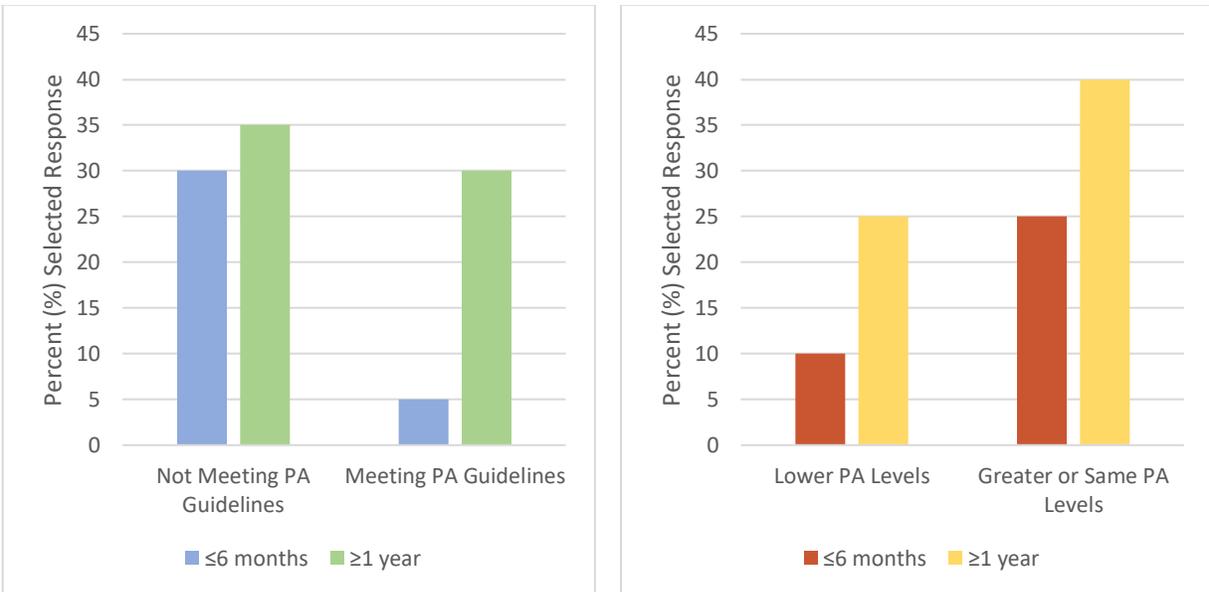


Figure 10. Maintenance Sessions (i.e., exercise and discussion sessions): Preference of Duration Based on PA Levels.

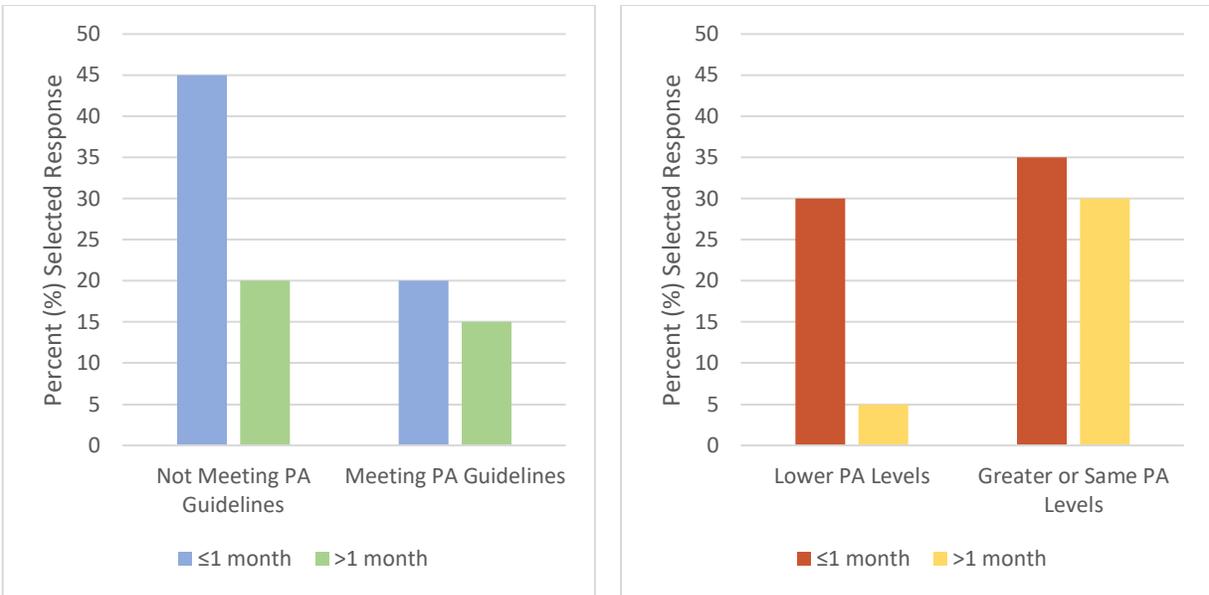


Figure 11. Maintenance Sessions (i.e., exercise and discussion sessions): Preference of Time to Commencement Following the Original Community-based Program Based on PA Levels.

3.2 Aim 2 (Qualitative) Results

In line with quantitative findings, qualitative feedback was positive and expanded on participant preferences regarding helpful elements to sustaining PA and barriers experienced following the completion of the original community-based program. Figure 12 displays the nine themes that emerged across four focus group questions, along with frequencies of emerging themes.

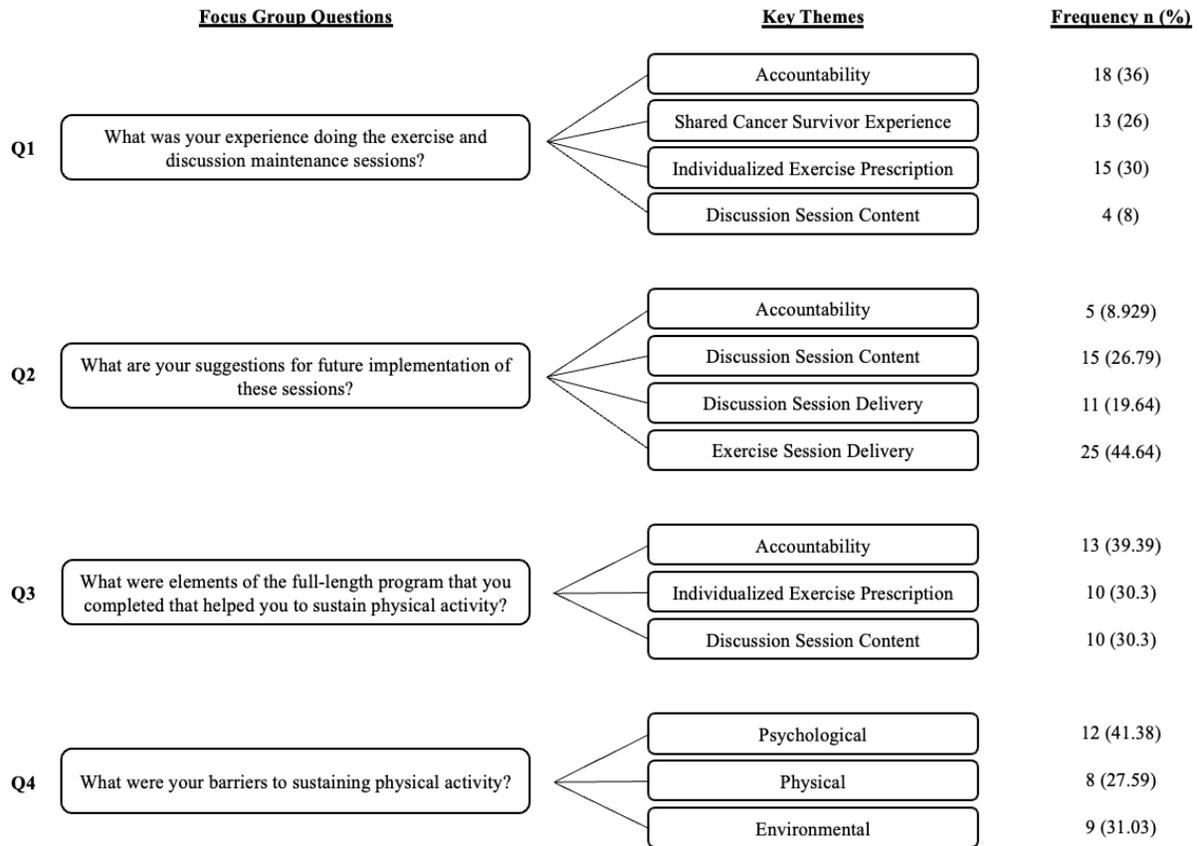


Figure 12. Key Themes Identified Along with Frequencies of References. Q = question.

3.2.1 Q1 Themes: Experience Doing the Exercise and Discussion Maintenance Sessions

Accountability

Accountability was an aspect of the maintenance program that was discussed most frequently amongst participants. Having exercise and discussion sessions at a fixed time helped keep participants accountable.

“The sessions help keep me accountable and if I haven't been intentionally active it helps remind me to get back to it.”

“Well, I think as a survivor and doing this program prior [referring to the original community-based program], I think it [referring to the maintenance session] would be very beneficial for us to stay accountable.”

Participants also expressed that participating in the maintenance program was motivating and promoted engagement in exercise outside of the maintenance sessions.

“And, to be honest um so here's what happened when I got done with that maintenance class. I came home and started lifting. Because it just made me remember like how good it feels to like lift and get back in there, and you know use weights and feel strong again so I'm back to it. It motivated me to get back into weightlifting something I hadn't been doing so thank you.”

Shared Cancer Survivor Experience

Participants appreciated that the maintenance sessions were comprised exclusively of cancer survivors who can relate to similar experiences and who hold shared understandings of each other's journeys.

“It's nice to be with a group of people that are going through the same thing or have been through the same things that you are. So I like that aspect of it as well.”

“It offers a place to share things as it is easier sometimes to share with strangers who are going through the same thing as you than it is to share with your support system.”

“Even if I met monthly and sat down in those talking circles [referring to maintenance discussion sessions] like we had for this study it was so good, just to hear like where everyone is at now in their journey like we all went through the hard part but we went through [the original community-based program] and now it sounds like we're experiencing a lot of the similar things after [the original community-based program].”

Individualized Exercise Prescription

Participants felt satisfied with the maintenance exercise sessions and were positively challenged by doing exercises that they had not been aware of or would not have attempted on their own.

*“I felt like I was getting a good workout, so that's why I would want to keep doing it”
“I learn new stuff I have learned so much you know, new exercises that be like so much easier that I said my god it looks so hard I can't do it, but you know it's not so bad so I'm loving it so far.”*

Participants also valued having exercise modifications provided for them by a cancer exercise instructor.

“... there's different levels. So like, whatever we're doing, if that's too much, you can do this. Oh, you can, you step it up? You can do this. So that, that was really helpful. And at times I felt like I had to adjust in both ways. Um, and so I felt like it was really like, it was just all good and really what I needed.”

Discussion Session Content

Participants found the guided discussion sessions helpful, as opposed to non-guided/open discussions. Feedback on discussion session topics was also provided. Participants predominantly agreed that the social cognitive theory-driven discussion topics, related to exercise, were helpful.

“I really appreciated the different presentations like SMART goals or things to that nature that really kind of helped rein me back in and kind of keep me focused on my own ideas and understanding.”

“For me, I think the discussions about exercises or trying new exercises or new activities in a safe environment is what was really appealing to me about [the original community-based program] and then the follow-up focus groups [referring to maintenance sessions]. Yeah just because my time is so limited and I'm already doing one thing in the in the cancer support group I think things related more to the fitness and exercise and health piece are what would be most helpful for me yeah.”

“I actually liked all the topics that I had been said, I agree with all of them.”

“I think I like the guided conversation where you guys asked the questions and then guided us through different conversations, which led into other topics which I think is better rather than us just going in without questions. It gives us something to think about, but I, I think it was nice that you guys facilitated those sessions.”

3.2.2 Q2 Themes: Suggestions for Future Implementation of the Maintenance Sessions

Accountability

Participants expressed a desire to stay in contact with past-participants of each original community-based program because they believed that it would promote accountability.

Recommendations included creating meet-up groups to facilitate ongoing exercise and open discussion sessions, or creating an indefinite zoom link that participants could join whenever their schedules permitted. Participants predominantly requested for meet-up groups to occur one time per week for an indefinite period of time.

“...Have zoom meetings or something like that, and whoever can join joins like once a week or something like that.”

“...Has there ever been a thought of possibly like group meetups every six months?... Maybe possibly everyone once in a while meetup and just like “hey how you doing?” ... And then it's like “how have you been doing working out?” I feel like that would really push everyone as well.”

Discussion Session Content

Several suggestions for discussion session content were identified, with no single topic dominating others across focus groups. Recommendations of discussion topics included how to overcome barriers to exercise, body image “*...I just looked at myself and go, this is not how I used to look*”, education on resources within the participants’ communities that support cancer survivors, and nutrition “*...how it relates to our health... I received very mixed messages about what we should and not eat*”. Fit Cancer participants completed social cognitive theory-based discussion sessions as a part of their original community-based program. Therefore, regarding maintenance discussion session topics, some Fit Cancer participants suggested to “*not revisit the same topics*”.

Discussion Session Delivery

Similar to discussion session content, participants had varying suggestions for the frequency and duration of discussion sessions. Participants predominantly suggested shorter discussion sessions ranging from 10 – 30 minutes total.

“30 minutes seems to me like that would be... even 15 minutes would probably take care of most of the discussion.”

“... have like a 10 or 15 minute discussion afterwards.”

There were discrepancies among participants regarding preferred frequency of discussion sessions. Some participants suggested having sessions *“at least once a week, if not two”* while others suggested *“once every two weeks”*. Other, less frequent, suggestions included having discussion sessions *“in the evening, so that those that do work can also participate”*, and having discussion sessions at a different time, rather than immediately after the exercise session, to avoid *“feeling rushed”*.

Exercise Session Delivery

There were many suggestions about components to add to the maintenance exercise sessions to improve its delivery. Two suggestions were more predominant than others, and both targeted ways to support accountability and accessibility to the maintenance exercise sessions. One recommendation to support accountability was to have check-ins with community-based program staff.

“...once a month check in with [community-based program leader] or something like that... one of the [community-based program leaders] could help and mentor you and making sure you understand what's going on [referring to exercise] and that type of thing. So maybe it's a little bit more individualized.”

This particular participant suggested that having program staff check-ins could also support continuation of individualized exercise and education on exercise topics. Another proposal was to have a point of contact to send exercise-related information to.

“Maybe some monthly check-ups with how you're doing and that type of thing, being responsible to send your statistics off to somebody.”

“...those forms that we filled out every week through the program, maybe once a month, we'd have to do that again, even if you don't even look at it, but just the fact that we had to do it, and we think you're looking at it maybe enough to hold me more accountable.”

Another predominant suggestion was to offer various maintenance exercise session times to improve accessibility.

“It's really hard sometimes during the workday so evenings or a weekend just to accommodate people who still work their schedules, a little bit would be helpful.”

“And so to go in the middle of the day, on a work day was hard.”

Participants agreed that exercise sessions should be offered at times outside of work hours; however, some concern was raised regarding evening session times.

“I would really appreciate an evening, but I also know, in my own experiences with a variety of workout places that's when they tend to be more full or the machines are less accessible.”

There was no particular time that participants agreed on, suggesting that ideal session times may vary program to program.

Regarding maintenance exercise sessions, many participants “... would hope to do it indefinitely”. Adding to this, one suggestion was to have “... a graduate class and people could come in as they wanted and offer it once a week.” Other suggestions included offering different

types of exercise classes like “*Tai Chi or stretch work*”, incorporating a competitive aspect like “*a Google sheet or something like that, and you fill it in and then it's a competition.*”

3.2.3 Q3 Themes: Elements of the Original Program that were Helpful for Sustaining Physical Activity

Accountability

One of the original community-based programs allowed cancer survivors to re-enroll into multiple 8-week long programs throughout the course of a year. In this particular case, one participant reported that the anticipation of upcoming programs helped keep them accountable, suggesting that maintenance sessions could play a similar role, without having to commit to the longer duration of a full community-based program.

“I didn't want to be out of really out of shape when the next group session came along.”

Another participant identified supervised exercise as a helpful component of their original community-based program that they may seek out because it would help them sustain PA levels.

“It has given me the forethought to maybe hire a personal trainer and see if I can get some more strength.”

Other participants reported that social support from other cancer survivors and exercise trainers helped build motivation and self-efficacy to continue exercise following program completion.

“I think the motivation and the confidence to get back into the gym was really motivating and just the support from the other people in the group and [the cancer exercise trainers] really made you feel like you could do it and that you didn't have to be perfect at everything and that even doing a little bit was better than doing nothing.”

Individualized Exercise Prescription

Participants mentioned that the original community-based program taught them how to be active and when to fit exercise into their individual daily routines.

“Where to begin, how to exercise, how important it is... I was never a physically active person... So this taught me how.”

“I remember them telling us do your workout and when you have the most energy and for me that's when I wake up in the morning.”

Another participant mentioned that they became cognizant of the need to engage in balance exercises after participating in their original community-based program, suggesting that they were not aware of this prior.

“As I'm getting older... I'm paying more attention to balance like something that I learned in [the original community-based program] we did the balance stuff and I didn't realize [referring to not realizing the need to focus on this component of fitness]... so really learning about what to focus on and be intentional about that, on my own, you know.”

Discussion Session Content

The Fit Cancer program completed discussion sessions as a part of their original community-based program, and participants reported what discussion session topics were most helpful to them. Discussions on goal setting (i.e., SMART goals) and the use of self-monitoring devices were predominantly mentioned. Since Fit Cancer participants received a Fitbit in the original community-based program, the extent to which discussion on self-monitoring devices versus the delivery and use of self-monitoring devices playing a role in sustaining PA, was not made clear in the focus groups.

“I can actually set it [referring to the Fitbit] so that it will alarm if I sit more than 45 minutes and it literally will shake and give me a wake up come on get your butt out of the chair and that's kind of a helpful thing for me.”

“But instead of using a Fitbit, I have an apple watch. So I go off of the apple watch, use the apple watch the same way that it seems like everybody kind of uses a Fitbit to monitor. I have goals set for every day and it tells me what to do.”

“I think for me, what was helpful was in the discussions when we talked about like what really the goals should be like, it should be, you know, exercise 150 minutes a week, plus some strength training and, you know, two to three times plus stretching.”

3.2.4 Q4 Themes: Barriers to Sustaining Physical Activity

Psychological, physical, and environmental barriers were identified by participants following completion of the original community-based program.

Psychological

The most prominent psychological barrier that participants reported was lack of motivation. Following the completion of the original community-based program, cancer survivors identified that it was difficult not having the accountability they received during the program.

“...Not being able to motivate myself to do it even though I know my life depends on it. Life just has a way of eating into your time and taking over... Having to be accountable to attend a class is what I truly believe would make me stick with it and exercise every week.”

“I feel like the barrier to me is missing that group that held me accountable.”

“...I need somebody to motivate me and watch.”

“...It's hard to make yourself motivated to do weights, I think, and that balance [referring to balance exercises that were performed in the original community-based program].”

Physical

The most reported physical barrier to sustaining physical activity was fatigue.

Undergoing active cancer treatment was also reported as a barrier.

“I did good during [the original community-based program] and then afterwards and then reached a time where I had some treatment fatigue and then it's like no I'm too tired to I can't even do this”

“Yeah I agree with fatigue, I definitely think that has been an issue”

Environmental

Multiple environmental barriers were reported; however, no barrier in particular dominated discussion. Identified barriers included temporary environmental changes like vacation that change and hinder exercise routines, weather, and accessibility to be active, or *not having access to a gym* or equipment to maintain exercise that was performed in the original community-based program.

“When we've had some heavy winds and honestly and I'm a birder I like to go out early and bird, well there's not a lot of birds, right now... I really have to say, these brutal winds we've had have been a bit discouraging.”

“We live in the country. So sometimes it's hard to walk on the roadway and that kind of thing. I don't enjoy that as much as I would enjoy walking more in town.”.

4. DISCUSSION

This study explored cancer survivors' preferences for a community-based PA maintenance program both qualitatively and quantitatively, along with whether preferences differed based on survivors' PA levels. Quantitative results from this study found that participants had positive perceptions of the maintenance program, regardless of PA levels prior to maintenance program commencement. Qualitative findings generally supported quantitative findings and expanded on participant preferences that were summarized by nine themes that emerged across 4 focus group questions.

4.1 Aim 1 (Quantitative)

Most participants reported enjoying the maintenance program, considering it to be helpful, and being likely to attend if it were to have been offered following the completion of their original community-based program. Most participants desired more frequent maintenance exercise sessions (1 time per week) than discussion sessions (1 or less times per month). The majority of participants also reported wanting the exercise maintenance program to begin immediately, or within 1 month, of the conclusion of the original community-based program, and would prefer that it last at least 1 year, or indefinitely.

In this study, there were no significant differences in maintenance program preferences based on participants' current PA levels, despite previous evidence that suggests pre-intervention PA levels and/or exercise history are associated with PA maintenance (Amireault et al., 2013; Courneya et al., 2009; Vallance J et al., 2010). It is possible that a larger sample size would be needed to detect a difference in maintenance program preferences and PA levels. This study

relied on self-report measures to assess PA levels, therefore it is possible that PA levels were not accurately represented and an objective measure might produce different findings. However, positive feedback received from participants on enjoyment, helpfulness, and likelihood of attending a maintenance program like the one offered in this study, indicate that even participants who were physically active desired some element(s) of the maintenance program that was offered (e.g., feedback from an exercise instructor, engagement with other cancer survivors, etc.). While participants in this study provided insight into helpful original program components and desired maintenance program elements (i.e., qualitative feedback), it remains uncertain which program elements are most effective in eliciting long-term engagement in PA, thus more research is needed. Future research should also consider how varying levels of program elements may elicit different effects on long-term PA levels in cancer survivors, as this may help optimize program resources. For instance, it may be unnecessary for all cancer survivors to partake in a comprehensive maintenance program; some may only need a behavior change discussion session to achieve sustained PA participation.

Given these findings and considering the inconsistencies within the literature regarding the determinants of PA maintenance, it is possible that anticipating survivors' preferences for a maintenance program solely based on a single individual-level factor, such as PA levels, may be overly simplistic for addressing the complexity of this behavior. Consequently, when developing a maintenance program, program leaders may consider taking into account the findings from this study and adapt their approach according to available resources. Therefore, future research should also consider the perspectives of program leaders to determine what they deem feasible for implementation.

4.2 Aim 2 (Qualitative)

Predominant themes reported regarding participants' experiences doing the maintenance program included the accountability that the program provided, having individualized exercise routines, along with being in a shared environment exclusively of cancer survivors. Similarly, exploratory research on cancer survivors perceived benefits of participating in a cancer-specific community-based exercise program were getting support from other cancer survivors and having exposure to tailored exercise (Catt et al., 2018).

Participants referenced accountability more frequently than any other theme across all focus group questions, meaning it was perceived as a helpful element during the original community-based program and is desired in a maintenance program. Various suggestions were given for how to promote accountability and included indefinite supervised exercise sessions or indefinite access to a Zoom link to exercise with other cancer survivors, having check-ins with program staff, etc. These findings are in line with those of a previous study in which cancer survivors reported elements of accountability (i.e., peer-support, knowledgeable instructors, and fixed exercise times) supported PA maintenance (Ranes et al., 2022). Similarly, a recent review found that supervised exercise sessions are an intervention strategy that is positively associated with PA maintenance in cancer survivors (Sheeran et al., 2023). Taken together, community-based program leaders should consider how to continue to provide accountability to participants in order to support PA following completion of the program. Based on the findings of this study, continuing in-person exercise supervision may not be required, and the use of other avenues such as Zoom may be a viable strategy to provide accountability. Future research should be done to determine how to best support accountability of cancer survivors while also optimizing community-based program resource utilization.

4.3 Comparing Quantitative and Qualitative Results

Most participants desired more frequent maintenance exercise sessions (1 time per week) than discussion sessions (1 or less times per month). However, qualitative data suggested having discussion sessions 1-2 times per week, or once every other week. Community-based program leaders may consider tailoring the frequency of maintenance discussion sessions to align with their own participants' feedback, or establish the frequency based on what is optimal for the discussion session leader and/or the availability of the space designated for discussion sessions.

Although participants generally reported positive perceptions of the maintenance discussion sessions, there was more variability in participants' quantitative responses to the helpfulness, likelihood of attendance, and enjoyment of the discussion sessions than in the responses regarding the exercise sessions. This may be because for Fit Cancer program participants, maintenance discussion session material was very similar to that used in the original program, whereas LIVESTRONG and STAC participants were not exposed to this information during their programs. Specifically, qualitative data revealed that Fit Cancer participants would prefer new/different topics and information for maintenance discussion sessions. Nevertheless, participants found topics like goal setting (SMART goals) and self-monitoring devices beneficial in the original program, suggesting that cancer survivors appreciated social cognitive theory-based discussion topics, albeit with a preference for different content in the maintenance program. Previous research suggests that the criteria influencing individuals to begin a change in behavior, like PA, differ from those that guide maintenance of that behavior (Rothman Aj, 2000). This may indicate a need for different discussion session topics in the maintenance program than in the original community-based program. However, evidence is needed to determine whether

the same behavior change techniques should be tailored differently for maintenance versus adoption, or if different techniques are necessary for each phase. A recent study found that supervised exercise was the only behavior change technique that predicted adoption plus maintenance of PA following an exercise intervention (Sheeran et al., 2023). Unfortunately, it remains unclear what part of supervised exercise (i.e., exercise instructor, prescribed workouts, etc.) predicts PA maintenance, thus supporting the need for further research.

Qualitative findings reported cancer survivors' desired community-based PA program elements (i.e., insights on helpful elements of the original program and future maintenance program suggestions). Quantitative data offered cancer survivors' perspectives on logistical factors of a maintenance program such as frequency, duration, and time gap to program commencement. Collectively, these findings may inform community-based program leaders seeking to implement a PA maintenance program by providing a robust foundation for how to structure a maintenance program, along with highlighting program elements to consider including, based on participant perspectives.

4.4 Strengths and Limitations

Study strengths included cancer survivor perspectives from three different community-based programs and the use of mixed methods to fully capture participants' experiences. Limitations of the study included a homogenous sample in terms of cancer type, sex, race, and ethnicity. While these characteristics align with the broader population of cancer survivors participating in community-based programs, they limit the generalizability of study findings. Another limitation of the study is the uneven distribution of participants amongst the three community-based sites. Since the majority of participants came from the Fit Cancer program,

qualitative data may be more representative of views of participants from that particular program.

4.5 Conclusion

Despite these limitations, findings from this study provide novel information regarding cancer survivors' preferences for PA maintenance program components. Results may inform community-based programs on how to support continued PA for participants. Future studies should measure effectiveness of a maintenance program and what level of support is needed to elicit PA maintenance, along with other health outcomes. Future studies should also encompass community-based program leader perspectives and consider how to implement maintenance components considering program resources (e.g., costs, staff time, etc.). In doing so, future research will contribute to the development of practical strategies to achieve implementation and optimization of PA maintenance programs in community-based settings.

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APPENDICES

Appendix A. Example of maintenance exercise session workouts from each community site.

STAC (In-Person)

Warm Up (3-5 minutes)

- Walk 1 lap with arm circles
- Marches

Cardio Workout (15 minutes)

- Participants choose a cardio machine (e.g., treadmill, elliptical, NuStep) and complete 5 intervals of varying intensities (self-determined).

<i>Interval Intensity</i>	<i>Time</i>
Low	3 min
Medium	3 min
High	3 min
Medium	3 min
Low	3 min

**No rest in between intervals*

Resistance Workout (3 rounds – 60s work, 30s rest)

- Banded sit-to-stand
- Banded standing kickbacks
- Triceps dip (chair)
- Banded side steps or banded jumping jacks
- Reverse chair crunches

Cool Down (5 minutes)

- Cross body arm stretch
- Finger lock, arms behind back stretch
- Series of lunge stretches
 - Side & forward lunges

Fit Cancer

Warm Up (3-5 minutes)

- Side steps
- Marching
- Heel flicks
- Hamstring sweeps
- Crab walks

Strength Workout (3 rounds, 10 reps)

- Sit-to-stand or squat or banded squat
- Banded pull apart

Balance Workout (3 rounds – 30s work, 20s rest)

- Around the world *Chair for balance
- Seated clam shell with mini bands

Workout 1 (3 rounds – 40s work, 15s rest)

- Row (banded or upright)
- Bicep Curl
- Cardio jabs

Workout 2 (3 rounds – 40s work, 15s rest)

- Side walk to X-band walks
- 2 feet calf raise
- V-steps

Cool down (3-5 minutes)

- Low back/hands on wall stretch
- Rear delt stretch
- Calf stretch
- Hip flexor with chair support
- Hamstring stretch

LIVESTRONG

Warm Up

- Side steps
- Marching
- Heel flicks
- Hamstring sweeps
- Crab walks

Cardio Workout (15-20 minutes)

- Participants choose a cardio machine (e.g., treadmill, elliptical, NuStep[®]), and their own pace.

Resistance Workout (3 rounds – 8 reps/exercise, rest while partner goes)

- Seated leg press
- Seated leg curl
- Arm curl (i.e., biceps curl)
- Lat pull down
- Chest press

Cool Down (3-5 minutes)

- Chest stretch
- Rear delt stretch
- Calf stretch
- Hip flexor with chair support
- Hamstring stretch

Appendix B. Feasibility and Acceptability Questionnaire

Exercise Session Questions	Response Options
Did you enjoy the maintenance exercise sessions?	Definitely no Somewhat no Indifferent Somewhat yes Definitely yes
Do you feel that attending exercise sessions like these, after completing an exercise program like Fit Cancer, STAC, or LIVESTRONG would help someone maintain or continue to increase activity/exercise levels?	Definitely no Possibly no Neither yes or no Possibly yes Definitely yes
If you were offered <u>exercise sessions</u> like these after completing Fit Cancer, STAC, or LIVESTRONG, what is your likelihood to attend these sessions?	Very likely Somewhat likely Indifferent Somewhat unlikely Very unlikely
If you were offered a maintenance program after participating in Fit Cancer, STAC or LIVESTRONG, how long after completing the program would you want the maintenance program to commence?	Immediately Within 3 months Within 6 months Longer than 6 months Other
If you were offered a maintenance program after participating in Fit Cancer, STAC or LIVESTRONG, how often would you have wanted to attend exercise sessions?	1 time per week Every other week Monthly Other
If you were offered a maintenance program after participating in Fit Cancer, STAC or LIVESTRONG, how long would you consider attending the maintenance program?	3 months 6 months 1 year Other

Discussion Session Questions	Response Options
Did you enjoy the maintenance discussion sessions?	Definitely no Somewhat no Indifferent Somewhat yes Definitely yes
Do you feel that attending discussion sessions like these, after completing an exercise program like Fit Cancer, STAC, or LIVESTRONG would help someone maintain or continue to increase activity/exercise levels?	Definitely no Possibly no Neither yes or no Possibly yes

	Definitely yes
If you were offered discussion sessions like these after completing Fit Cancer, STAC, or LIVESTRONG, what is your likelihood to attend these sessions?	Very likely Somewhat likely Indifferent Somewhat unlikely very unlikely
If you were offered a maintenance program after participating in Fit Cancer, STAC or LIVESTRONG, how often would you have wanted to attend discussion sessions?	1 time per week Every other week Monthly Other
What other topics related to helping you stay active or increasing your physical activity would you have wanted to be included in the maintenance program discussion sessions? Please describe in more detail here:	(Free response)

Appendix C. Semi-Structured Focus Group Protocol.

1. Brief introductions (Name, and when they participated in Fit Cancer, LIVESTRONG or STAC).
 - a. Before we start, does anyone have any questions?
2. First let's talk about your activity since you originally completed [Fit Cancer, STAC, or LIVESTRONG]. In what ways have you been able to keep exercising/stay active since the original program ended?
 - a. What did you learn during [Fit Cancer, STAC, or LIVESTRONG] that helped keep you exercising/active after the program ended?
 - b. What else has helped you stay active since the program ended?
 - c. What are some challenges or barriers to staying active that you have experienced since you completed [Fit Cancer, STAC, or LIVESTRONG]?
3. What do you think about [Fit Cancer, LIVESTRONG, STAC] offering exercise and physical activity discussion sessions after the program is over, similar to the example sessions you participated in?
 - a. Would it be something that you would have found useful, or think would help future [Fit Cancer, STAC, or LIVESTRONG] participants stay active after the program ends?
 - b. Why do you believe these sessions would be useful or helpful in the future? OR if you believe they wouldn't be helpful, why not?
4. Let's talk a little more specifically about the exercise sessions.
 - a. If exercise sessions were available after completing [Fit Cancer, LIVESTRONG, STAC] would you have attended them?
 - i. If no, what would need to happen for you to attend such sessions?
 - ii. What do you think would be the right amount of exercise sessions in a maintenance program? (i.e., sessions per week, duration offered)
 - b. STAC Only: Did you prefer participating in the exercise sessions face-to-face or virtually?
 - i. What did you like about face-to-face delivery?
 1. What do you see as the advantages or disadvantages to face-to-face delivery?
 - ii. What did you like about virtual delivery?
 1. What do you see as the advantages or disadvantages to virtual delivery?
5. Let's talk a little more specifically about the discussion sessions.
 - a. If discussion sessions were available after completing [Fit Cancer, LIVESTRONG, STAC] would you have attended them?
 - i. If no, what would need to happen for you to attend such sessions?
 - ii. What do you think would be the right amount of discussion sessions in a maintenance program? (i.e., sessions per week, duration offered)
 - iii. During the example maintenance discussion sessions with, you discussed goal setting, barriers to physical activity, self-monitoring, and action

planning in discussion sessions. Do you think these are appropriate topics to include in a maintenance program?

1. Were there any discussion topics that you think should be included to help [Fit Cancer, LIVESTRONG, STAC] participants stay active after the program ends?
- b. STAC Only: Did you prefer participating in the discussion sessions face-to-face or virtually?
 - i. What did you like about face-to-face delivery?
 1. What do you see as the advantages or disadvantages to face-to-face delivery?
 - ii. What did you like about virtual delivery?
 1. What do you see as the advantages or disadvantages to virtual delivery?
6. Based on your experience, what else would help [Fit Cancer, LIVESTRONG, STAC] participants keep exercising after the original program ends?