

A Pilot Study Examining the Motivational Effects of Resistance Training 3 Versus 2 Days Per Week in Prostate Cancer Survivors

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Abstract

Background: We previously reported a pilot randomized controlled trial in prostate cancer survivors suggesting that resistance training (RT) 3 days/week versus 2 days/week may improve physical functioning but may also blunt psychosocial improvements. Here, we explore potential motivational explanations for this paradoxical effect.

Methods: Prostate cancer survivors (N=30) were randomized to 12 weeks of supervised RT either 3 days/week (n=16) or 2 days/week (n=14). Using the theory of planned behavior, we assessed patient preference for group assignment, perceived difficulty (including specific barriers), perceived benefits (including specific benefits), perceived enjoyment, and perceived support for the RT programs.

Results: Patient preference for group assignment was balanced at pre-randomization and did not change after the intervention. At post intervention, there were potentially meaningful differences suggesting that the 3 days/week group perceived less support ($d=-0.40$; $p=0.27$), more difficulty ($d=+0.36$; $p=0.34$), and fewer benefits ($d=-0.30$; $p=0.37$) than the 2 days/week group. Moreover, the 3 days/week group reported less benefit for self-esteem ($d=-0.92$; $p=0.010$), physical functioning ($d=-0.82$; $p=0.012$), fatigue ($d=-0.73$; $p=0.041$), cardiovascular endurance ($d=-0.67$; $p=0.058$), and happiness ($d=-0.64$; $p=0.066$). Finally, there were potentially meaningful differences suggesting that the 3 days/week group perceived more barriers to the RT program including feeling sick ($d=+0.42$; $p=0.27$), traveling to the fitness center ($d=+0.36$; $p=0.32$), and other medical problems ($d=+0.25$; $p=0.49$).

Conclusions: These preliminary data suggest the hypotheses that perceptions of less support, fewer benefits, and more barriers explain why prostate cancer survivors performing RT 3 days/week versus 2 days/week experience fewer psychosocial benefits. These hypotheses should be investigated in larger trials.

Keywords: Exercise; Frequency; Motivation; Physical activity; Strength training; Theory of planned behavior

Introduction

Resistance training (RT) is an established supportive care intervention for prostate cancer survivors that improves muscular strength, lean body mass, physical functioning, fatigue, and quality of life [1-3]. Randomized controlled trials have shown that either 2 days/week [4-9] or 3 days/week [10-16] of RT improves these outcomes. Based on this research, the American College of Sports Medicine [17] and the American Cancer Society [18] recommend that prostate cancer survivors perform RT 2 or 3 days/week. No study to date, however, has directly compared the effects of 3 versus 2 days/week of RT in prostate cancer survivors to determine what, if any, additional benefits are gained from a 3rd day/week of RT. To begin to address this question, we conducted a pilot randomized controlled trial comparing the effects of 3 versus 2 days/week of RT on physical functioning and quality of life in prostate cancer survivors [19]. As hypothesized, we found preliminary evidence that 3 days/week of RT may improve muscular strength and physical functioning compared to 2 days/week. Contrary to expectations, however, we found preliminary evidence that 3 days/week of RT may actually blunt the improvements in psychosocial functioning compared to 2 days/week. Although these counterintuitive findings need to be confirmed in a larger phase III trial, we speculated that the blunted psychosocial response may have resulted from: (a) the additional time commitment that takes away from other desired or required activities, (b) the associated stress of trying to exercise a third day each week, (c) exacerbation of symptoms such as fatigue, pain, or hot flashes, (d) minor injuries or soreness, and/or (e) boredom from performing the RT program. During the trial, we collected data on the motivational basis of the RT programs that may help explain this blunted psychosocial response. The purpose of this

paper was to explore the motivational basis of 3 versus 2 days/week of RT in prostate cancer survivors to generate hypotheses for larger phase II and III trials. Our investigation was guided by the theory of planned behaviour (TPB) [20]. We explored differences between the groups on these motivational variables including patient preference for group assignment (conceptualized as what one would intend to do if given the choice), emotional response to randomized group assignment, perceived difficulty (including specific barriers or control beliefs), perceived benefits (including specific benefits or behavioural beliefs), perceived enjoyment, and perceived support. Based on our preliminary data suggesting a better psychosocial response in the 2 days/week group [19], we expected that the 2 days/week group would report a more favourable motivational profile including more support, more enjoyment, more benefits related to psychosocial outcomes and less difficulty/fewer barriers to performing the RT program.

Materials and Methods

Setting and participants

The methods of our pilot randomized controlled trial have

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been reported elsewhere [19]. Briefly, the Alberta Cancer Registry identified 500 prostate cancer survivors living in Edmonton diagnosed as recently as possible. Men were eligible if they had histologically confirmed non-metastatic prostate cancer [1], no medical conditions that contraindicated RT [2], were between 18 and 80 years old [3], and were not currently performing RT ≥ 2 days/week [4]. The trial received ethics approval from the Health Research Ethics Board of Alberta-Cancer Committee and written informed consent was obtained from all participants.

Design and procedures

Prospective participants were mailed a recruitment package from the cancer registry that explained the nature of the study. Interested participants were asked to contact the research coordinator. If eligible and interested, participants were asked to complete baseline assessments including muscular strength tests, physical functioning tests, and a questionnaire. After baseline measurements, participants were stratified by primary treatment (surgery versus radiation versus active surveillance) and current hormone therapy use (no versus yes) and randomized to either 3 days/week or 2 days/week of RT using a computer-generated random numbers list. A research assistant not otherwise involved in the study generated the group assignment.

Intervention

The RT interventions have been described elsewhere [19]. Briefly, the RT interventions were identical for both groups except for the frequency (3 days/week versus 2 days/week), resulting in a roughly 50% greater weekly volume of RT in the 3 days/week group. Participants were asked to complete 12 weeks of supervised RT with at least one rest day between sessions. The resistance exercises included the chest press, leg press, latissimus pull-down, leg curl, shoulder press, and leg extension. The program was divided into four, 3 week phases and was periodized to progressively increase the number of sets, intensity, and exercises throughout the 12 week program. To individualize the RT program, each participant increased the weight lifted within each training phase if they could complete more repetitions than was prescribed on the last set. All RT sessions were supervised by qualified exercise specialists and the intervention was delivered on an individual basis at the Behavioural Medicine Fitness Center at the University of Alberta.

Measures

Data for the present report were contained in the questionnaire which was completed at baseline (prior to randomization) and post intervention (after the 12 week intervention). The variables assessed included patient preference for group assignment, emotional response to randomized group assignment, motivational impact based on the TPB, and specific perceived benefits (i.e., behavioural beliefs) and barriers (i.e., control beliefs).

Patient preference

Prior to randomization, participants were asked "Which exercise program would you prefer if you had the choice?" The three options were: (a) the weight training program twice per week, (b) the weight training program three times per week, or (c) no preference. After the intervention, participants were asked: "Thinking back, how did you feel when you found out which RT program you were randomly assigned to?" with response options ranging from 1-3 (extremely-quite-slightly disappointed) to 4 (neutral) to 5-7 (slightly-quite-extremely pleased). Participants were also asked "Looking back, now that the resistance training program is over, which group do you wish you had been

assigned to?" Once again, the response options were (a) the weight training program twice per week, (b) the weight training program three times per week, or (c) no preference.

Motivational evaluation

At the end of the 12 week intervention, participants completed a retrospective motivational evaluation of their RT program based on the TPB. The questions asked were: (a) how beneficial was the RT program?, (b) how enjoyable was the RT program?, (c) how supportive were family and friends of the RT program?, (d) how difficult was the RT program?, and (e) how motivated were you to do the RT program? Participants also completed a prospective motivational evaluation for which they were asked to anticipate how beneficial, enjoyable, supported, difficult, and motivated they would be to continue the RT program on their own over the next six months. Evaluations for both sets of questions were on a 5 point scale (1=not at all, 2=a little bit, 3=somewhat, 4=quite a bit, 5=very much).

Specific perceived benefits and barriers

Specific perceived benefits were measured at post intervention using a 14 item questionnaire that listed the main primary and secondary outcomes assessed in the study [19]. Participants were asked "What affect, if any, did the resistance training program have on each of the following for you?" (e.g. physical functioning, fatigue, sleep quality) with responses on a 7 point scale ranging from 1-3 (very much-somewhat-slightly worse) to 4 (no change) to 5-7 (slightly-somewhat-very much improved). A higher score indicated a greater perceived benefit. Specific perceived barriers were measured at post intervention using a 12 item questionnaire that listed common barriers to exercise in cancer survivors identified in previous research [21,22]. Participants were asked "How much of a barrier was each of the following for you in trying to do the resistance training program?" with responses on a 7 point scale ranging from 1 (not at all) to 3 (somewhat) to 5 (a fair bit) to 7 (very much). A higher score indicated a greater perceived barrier.

Statistical analyses

Given that our pilot study was designed as "hypothesis-generating" to inform future research rather than as "hypothesis-testing" to inform clinical practice, the results were interpreted for statistical trends ($p < 0.10$) and clinical significance (standardized effect size ds). Patient preference for group assignment was analyzed using chi-square analyses. Comparisons between groups on motivational factors and specific perceived benefits and barriers were analyzed using independent t-tests after confirming the normality of the data. All statistical analyses were performed in SPSS 21 (SPSS Inc., Chicago, IL) using intention-to-treat principles.

Results

Participant flow through the trial has been reported elsewhere [19]. Briefly, 14 men were randomized to the 2 days/week RT group and 16 to the 3 days/week group. The groups were balanced on the key baseline characteristics including age, employment status, marital status, disease stage, and treatments received [19]. Adherence to the RT intervention was 100% (24/24) for the 2 days/week group and 97% (35/36) for the 3 days/week group, and all 30 participants completed the postintervention questionnaire [19].

Patient preference

At pre-randomization, 20% of participants preferred RT twice/week, 33% preferred RT three times/week, and 47% had no preference

($p=0.56$; Figure 1). At post intervention, 13.3% preferred RT twice/week, 53.3% preferred RT three times/week, and 33.3% had no preference ($p=0.55$; Figure 1). There was no significant change in patient preference from pre randomization to post intervention ($p=0.32$; Figure 1). Moreover, there were no significant differences in the emotional response of participants to randomized group assignment (1; Figure 2). The majority of participants randomized to both groups were quite-to-extremely pleased with their randomized group assignment.

Motivational evaluation

Motivational evaluation of the RT programs are presented in Table 1. For the retrospective evaluation of the supervised RT program, there were potentially meaningful differences suggesting that the 3 days/week group perceived less support ($d=-0.40$; $p=0.27$), more difficulty ($d=+0.36$; $p=0.34$), and fewer benefits ($d=-0.30$; $p=0.37$) than the 2 days/week group. For the prospective evaluation of continuing the RT program on their own, there was a statistical trend and/or potentially meaningful differences suggesting that the 3 days/week group anticipated more difficulty ($d=+0.56$; $p=0.069$), less benefit ($d=-0.43$; $p=0.18$), less enjoyment ($d=-0.40$; $p=0.23$), less support from family and friends ($d=-0.38$; $p=0.26$), and less motivation for doing the RT program ($d=-0.56$; $p=0.14$).

Specific perceived benefits and barriers

Table 2 reports the specific perceived benefits of the RT program overall and by group assignment. On average, all outcomes were perceived to have improved. The largest perceived benefits were for muscular strength, physical functioning, and quality of life. The smallest perceived benefits were for injury/illness, depressive symptoms, and anxious feelings. The 3 days/week group perceived significantly less improvement than the 2 days/week group for self-esteem ($d=-0.92$; $p=0.010$), physical functioning ($d=-0.82$; $p=0.012$), fatigue ($d=-0.73$; $p=0.041$), cardiovascular endurance ($d=-0.67$; $p=0.058$), and happiness ($d=-0.64$; $p=0.066$); and potentially meaningful less improvements for anxiety ($d=-0.55$; $p=0.15$), stress ($d=-0.50$; $p=0.16$), sleep quality ($d=-0.45$; $p=0.19$), quality of life ($d=-0.44$; $p=0.22$), depressed feelings ($d=-0.42$; $p=0.19$), body weight or shape ($d=-0.33$; $p=0.39$), and ability to complete treatments ($d=-0.31$; $p=0.39$). No potentially meaningful differences emerged for injury/illness or muscular strength.

Table 3 reports the specific perceived barriers to the RT program overall and by group assignment. On average, all barriers were perceived as minor. The largest perceived barriers were pain, lack of

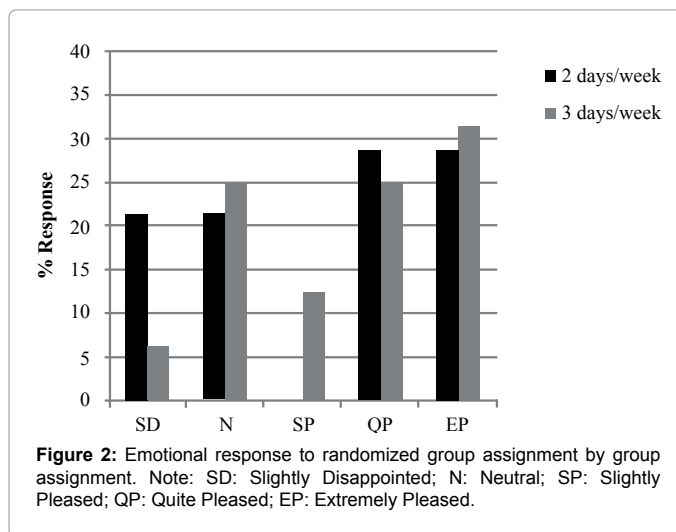


Figure 2: Emotional response to randomized group assignment by group assignment. Note: SD: Slightly Disappointed; N: Neutral; SP: Slightly Pleased; QP: Quite Pleased; EP: Extremely Pleased.

Variable	Overall (N=30)	2 days/week (n=14)	3 days/week (n=16)	p value	d
	Mean (SD)	Mean (SD)	Mean (SD)		
¹ Reaction to group					
Assignment, Mean (SD)	5.4 (1.5)	5.2 (1.6)	5.5 (1.4)	0.61	0.2
² Supervised resistance training					
Over the past 12 weeks, Mean (SD)					
Beneficial	4.4 (1.0)	4.6 (1.1)	4.3 (0.9)	0.37	-0.3
Enjoyable	4.3 (1.0)	4.4 (1.2)	4.3 (0.9)	0.91	-0.1
Supported	4.7 (0.5)	4.8 (0.6)	4.6 (0.5)	0.27	-0.4
Motivated	4.5 (0.6)	4.6 (0.5)	4.5 (0.6)	0.74	-0.17
Difficult	2.1 (1.1)	1.9 (1.1)	2.3 (1.1)	0.34	0.36
² Unsupervised resistance training					
Over the next 6 months, Mean (SD)					
Beneficial	4.5 (0.7)	4.7 (0.5)	4.4 (0.8)	0.18	-0.43
Enjoyable	3.9 (1.0)	4.1 (0.9)	3.7 (1.1)	0.23	-0.4
Supported	4.4 (0.8)	4.6 (0.6)	4.3 (0.9)	0.26	-0.38
Motivated	4.1 (0.9)	4.4 (0.7)	3.9 (1.0)	0.14	-0.56
Difficult	2.2 (0.9)	1.9 (0.8)	2.4 (0.9)	0.069	0.56

Note: ¹Reaction to group assignment measured on a 7 point scale ranging from 1-3 (extremely-quite-slightly disappointed) to 4 (neutral) to 5-7 (slightly-quite-extremely pleased). ²Motivational evaluations were measured on a 5 point scale (1=Not at all, 2=A little bit, 3=Somewhat, 4=Quite a bit, 5=Very much). A higher score indicates higher motivation except for difficulty.

Table 1: Motivational evaluation of resistance training in prostate cancer survivors.

time/too busy, and medical/health problems. The smallest perceived barriers were nausea, bad weather, and medical appointments. Potentially meaningful differences were found suggesting that the 3 days/week group perceived greater barriers than the 2 days/week group for feeling sick/not feeling well ($d=+0.42$; $p=0.27$), traveling to/from the fitness center ($d=+0.36$; $p=0.32$), and other medical/health problems ($d=+0.25$; $p=0.49$). Conversely, fatigue was potentially a larger barrier for the 2 days/week group ($d=-0.50$; $p=0.12$).

Discussion

We previously reported that RT 3 days/week may improve some aspects of muscular strength and physical functioning compared to 2 days/week in prostate cancer survivors but may also blunt some improvements in psychosocial outcomes [19]. The purpose of the present study was to explore possible motivational explanations for this blunted

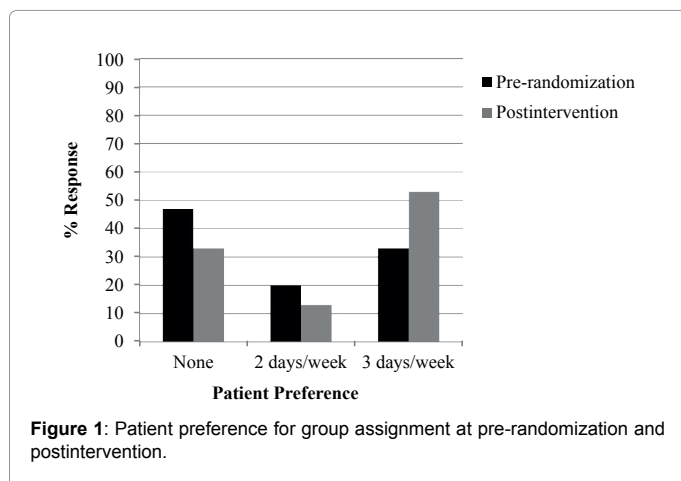


Figure 1: Patient preference for group assignment at pre-randomization and postintervention.

Variable	Overall (N=30)	2 days/week (n=14)	3 days/week (n=16)	p value	d
	Mean (SD)	Mean (SD)	Mean (SD)		
Large differences favoring 2 days/week					
Self-esteem	5.4 (1.2)	6.0 (1.0)	4.9 (1.1)	0.01	-0.92
Physical functioning	6.0 (1.1)	6.5 (0.7)	5.6 (1.2)	0.012	-0.82
Moderate differences favoring 2 days/week					
Fatigue	5.4 (1.1)	5.9 (0.9)	5.1 (1.1)	0.041	-0.73
Cardiovascular endurance	5.5 (1.2)	5.9 (1.1)	5.1 (1.1)	0.058	-0.67
Happiness	5.5 (1.1)	5.9 (1.1)	5.2 (1.0)	0.066	-0.64
Anxious feelings	5.0 (1.1)	5.3 (1.1)	4.7 (1.1)	0.15	-0.55
Stress	5.2 (1.2)	5.5 (1.3)	4.9 (1.1)	0.16	-0.5
Small differences favoring 2 days/week					
Sleep quality	5.1 (1.1)	5.4 (1.4)	4.9 (0.9)	0.19	-0.45
Overall quality of life	5.7 (0.9)	5.9 (0.9)	5.5 (0.9)	0.22	-0.44
Depressed feelings	4.8 (1.2)	5.1 (1.3)	4.6 (1.1)	0.19	-0.42
Body weight or shape	5.4 (1.2)	5.6 (1.1)	5.2 (1.3)	0.39	-0.33
Ability to complete treatments	5.1 (1.3)	5.3 (1.3)	4.9 (1.3)	0.39	-0.31
No differences between groups					
Illness or injury	4.8 (1.2)	4.9 (1.2)	4.7 (1.1)	0.69	-0.17
Muscular strength	6.3 (0.9)	6.4 (0.8)	6.3 (1.0)	0.75	-0.01

Note: Perceived benefits were measured on a 7 point scale ranging from 1-3 (very much-somewhat-slightly worse) to 4 (no change) to 5-7 (slightly-somewhat-very much improved). A higher score indicates a greater perceived benefit.

Table 2: Specific perceived benefits of participating in either 3 days/week or 2 days/week of supervised resistance training in prostate cancer survivors.

psychosocial response in order to generate hypotheses that could be tested in larger phase II and III trials. Interestingly, patient preference pre-randomization was roughly balanced among the men with 20% preferring 2 days/week, 33% preferring 3 days/week, and almost 50% having no preference. Moreover, the emotional response to group assignment was largely positive and did not differ between the groups. These data suggest that men did not initially view the two interventions as substantively different in terms of their desirability, providing evidence of clinical equipoise between the two interventions. This finding is consistent with the Supervised Trial of Aerobic versus Resistance Training (START) comparing RT, aerobic exercise, and no exercise in 242 breast cancer patients which reported that 41% preferred RT, 36% preferred aerobic exercise, and 23% had no preference [23]. The finding contrasts sharply, however, with the Healthy Exercise for Lymphoma Patients (HELP) Trial that compared an aerobic exercise intervention to no exercise in 122 lymphoma patients and found that 85% of patients preferred the exercise intervention, 13% had no preference, and only 2% preferred no exercise [24]. Moreover, patients randomized to the no exercise intervention in the HELP Trial had a very negative emotional response to their group assignment [24,25]. The clinical equipoise in the present trial suggests that the blunted psychosocial response in the 3 days/week group is not explained by pre-randomization differences in patient preference. Moreover, the clinical equipoise bodes well for recruitment in a larger phase III trial as physicians will likely be willing to randomize patients—and prostate cancer survivors will likely be willing to be randomized—in a trial comparing 3 versus 2 days/week of RT. Consistent with our expectations, we found the 2 days/week group reported greater psychosocial benefits than the 3 days/week group for self-esteem, happiness, anxiety, stress, and depression. These findings are consistent with our primary analyses showing potentially greater improvements on the measured psychosocial outcomes in the 2 days/week group compared to the 3 days/week group [19]. These findings are also consistent with the HELP Trial which showed that a simple measure of perceived benefits after the intervention was consistent with the actual measured outcomes in the trial [25]. Contrary to our hypotheses, however, we found that the 2 days/week group also reported greater benefits in physical functioning and cardiovascular fitness—and no

difference in muscular strength—despite the primary analysis showing larger fitness benefits for the 3 days/week group. These data suggest that the positive psychosocial response in the 2 days/week group may have influenced their perceptions of the physical health benefits.

Consistent with our expectations, we also found that the 3 days/week group reported greater barriers to the RT program from feeling sick, symptoms and side effects, and other medical/health problems. These findings suggest that health issues and lingering side effects are more challenging barriers to performing RT 3 versus 2 days/week and could explain some the blunted psychosocial response. Nevertheless, the specific symptoms we assessed including fatigue, pain, urinary incontinence, and nausea were not different between the groups suggesting that other symptoms or health conditions may be more problematic such as hot flashes, body image issues, musculoskeletal problems, or heart disease. These other specific barriers should be examined in future trials. We also found that travelling to and from the fitness center was more of a barrier for the 3 days/week group than the 2 days/week group but not lack of time. These data suggest that travelling to the fitness center may be more of a logistical barrier than a time barrier. Interestingly, the 3 days/week group reported that they received less social support for the RT program, and anticipated less social support in the future. Although speculative, it is possible that the spouses of these men (70% were married) were less supportive of a program that required them to be away from home 3 days/week rather than 2 days/week. If this time away from home interfered with other family plans or caused conflict, it could be a source of distress among couples that may blunt the psychosocial benefits in the 3 days/week group. The role of social support in general, and spousal support in particular, may be worthy of investigation in a III trial on this question.

Finally, although the 3 days/week group did not rate the RT program as less enjoyable than the 2 days/week group in the retrospective evaluation, they did anticipate it would be less enjoyable over the next 6 months. These data suggest the possibility that aspects of the 3 days/week group such as boredom, the difficulty of doing it, and/or the physical discomfort of lifting weights may lead to a less enjoyable experience and explain the blunted psychosocial benefits.

Variable	Overall (N=30)	2 days/week (n=14)	3 days/week (n=16)	p value	d
	Mean (SD)	Mean (SD)	Mean (SD)		
Barriers > for 3 days/week group					
Feeling sick/not feeling well	1.5 (1.2)	1.2 (0.4)	1.7 (1.5)	0.27	0.42
Traveling to the fitness center	1.8 (1.4)	1.5 (0.8)	2.0 (1.7)	0.32	0.36
Other medical/health problems	1.9 (1.6)	1.7 (1.6)	2.1 (1.6)	0.49	0.25
Barriers > for 2 days/week group					
Feeling tired or fatigued	1.8 (0.8)	2.0 (0.8)	1.6 (0.7)	0.12	-0.5
Barriers the same for both groups					
Too busy and had limited time	2.1 (1.5)	2.1 (1.7)	2.1 (1.4)	0.92	0
Lack of motivation	1.4 (0.7)	1.4 (0.5)	1.4 (0.8)	0.75	0
Urinary incontinence	1.7 (1.3)	1.6 (0.9)	1.7 (1.6)	0.92	0.08
Medical appointments	1.3 (1.0)	1.3 (0.6)	1.4 (1.3)	0.81	0.1
Bad weather	1.1 (0.4)	1.2 (0.6)	1.1 (0.3)	0.34	-0.15
Nausea/vomiting	1.1 (0.4)	1.1 (0.5)	1.0 (0.0)	0.29	-0.15
Pain or soreness	2.2 (1.3)	2.3 (1.1)	2.1 (1.5)	0.65	-0.15
Symptoms/treatment side effects	1.6 (1.2)	1.5 (0.7)	1.7 (1.5)	0.67	0.17

Note: Perceived barriers were measured on a 7 point scale ranging from 1 (not at all) to 3 (somewhat) to 5 (a fair bit) to 7 (very much). A higher score indicates a greater perceived barrier.

Table 3: Specific perceived barriers to participating in either 3 days/week or 2 days/week of supervised resistance training in prostate cancer survivors.

Future research should explore what makes RT programs enjoyable and unenjoyable and determine if any of these factors may be influenced by RT frequency.

The present study has important strengths including being the first to explore the motivational basis of RT frequency in prostate cancer survivors, the adoption of a validated theoretical model to understand motivation, the assessment of patient preferences before and after the trial, the assessment of specific benefits and barriers, and the perfect follow-up rate. The primary limitation of this pilot study is that it is “hypotheses-generating” rather than “hypotheses-testing”. The hypotheses generated by this pilot study need to be tested and confirmed (or refuted) in larger phase II and III trials. Other limitations include the modest recruitment rate, the post intervention patient preference question after participating in only one of the interventions, and the failure to assess specific normative beliefs (i.e., support from specific people such as the spouse).

In conclusion, patient preference pre-randomization and the emotional response to randomization were roughly balanced between the groups suggesting that there was no pre randomization differences that could explain the potentially blunted psychosocial response found with a 3rd day of RT/week. After the intervention, the 2 days/week group perceived more benefits than the 3 days/week group for both physical and mental health outcomes, suggesting a more positive response to the intervention. Furthermore, the 3 days/week group reported more barriers to supervised RT related to treatment side effects, health conditions, and travel to the fitness centre, suggesting that they perceived the intervention to be more difficult to complete. Finally, the 2 days/week group perceived more social support for their RT program, raising the possibility that less social support may explain the more muted psychosocial response in the 3 days/week group. These possible explanations for a negative dose-response effect of RT frequency on psychosocial outcomes in prostate cancer survivors generate hypotheses that should be investigated in larger phase II and III trials. Understanding the motivational basis of 3 versus 2 days/week of RT in prostate cancer survivors may allow for a modified intervention that could optimize the physical health benefits without sacrificing the psychosocial benefits.

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