Long-term Evaluation of the "Get Fit for Active Living" Program*†

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RÉSUMÉ

Cette étude a examiné les niveaux de 6 et 12 mois d'adhésion à l'activité physique, les changements fonctionnels et les déterminants psychosociaux de l'activité physique chez 176 adultes âgés qui ont participé au programme pilote «Get Fit for Active Living» (GFAL). Des mesures fonctionnelles et psychosociales ont été menées en personne à 6 mois; à 12 mois, les mesures psychosociales et la participation à l'activité physique ont été évaluées par interview téléphonique. Quatre-vingt-quinze pour cent ont été retenus dans l'étude au suivi de 6 mois, et 88 pour cent à 12 mois. Le taux d'adhésion autodéclaré à l'exercice à 12 mois était de 66%. La principale raison de la participation continue dans l'exercice était de maintenir la santé (45%). Les motifs de non-respect étaient la maladie (38%) et le manque de motivation (32%). Les résultats identifient les facteurs associés aux changements positifs de comportement que les promoteurs peuvent utiliser lorsqu'ils ciblent une population âgée. Les résultats du projet GFAL peuvent servir de modèle pour des programmes d'exercices durables et communautaires pour les aînés.

ABSTRACT

This study examined six- and 12-month levels of adherence to physical activity, functional changes, and psychosocial determinants of physical activity in 176 older adults who participated in the "Get Fit for Active Living (GFAL)" pilot program. Functional and psychosocial measures were conducted in person at six months; psychosocial measures and physical activity participation were assessed by telephone interview at 12 months. Ninety-five per cent were retained in the study at the six-month follow-up, and 88 per cent at 12 months. The self-reported adherence rate to exercise at 12 months was 66 per cent. The main reason for continued exercise participation was to maintain health (45%). Reasons for nonadherence were illness (38%) and lack of motivation (32%). Results identify factors associated with positive behaviour change that health promoters can utilize when targeting the older adult population. The GFAL project results can serve as a model for sustainable, community-based older-adult exercise programs.

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The strong and complementary need for research into whether the benefits of exercise programs can occur through less structured, community-based programs is clear (Wilcox et al., 2006). In addition to exercise instruction, other researchers have recommended that physical activity interventions be designed to change behaviour in order to increase (Conn, Minor, Burks, Rantz, & Pomeroy, 2003) and sustain physical activity levels (Marcus et al., 2006). The Get Fit for Active Living (GFAL) program addresses these issues for the older adult population in a sustainable, evidence-informed, educational, and experiential program (Stathokostas, Speechley, Little, Doerksen, & Paterson, 2016). The GFAL incorporates current best-evidence strategies that may lead to increased long-term adherence to physical activity recommendations and allows older adults to either continue exercising on their own or to easily assimilate into a community program of their choice post-participation in the GFAL program. In addition to utilizing both behavioural and experiential approaches to physical activity promotion, the present study also addressed issues related to decreased long-term compliance to physical activity. A reinforcement strategy arm of post-program booster sessions was implemented to investigate potential enablers of long-term maintenance, crucial to sustainable health benefits.

We hypothesized that the GFAL program would increase participant self-efficacy in developing an exercise program, increase their confidence in exercise participation, and increase their functional fitness, thus facilitating continued participation in the recommended physically active lifestyle. The objectives of this study were as follows: (1) study the longer-term (six- and 12-month) levels of adherence to physical activity of older adults who have participated in the GFAL program; (2) determine the long-term (six-month) functional fitness changes post-GFAL participation; (3) determine the long-term (six- and 12-month) changes in psychosocial determinants of physical activity; (4) provide an exploratory description of factors associated with continued physical activity participation and issues related to noncompliance; and (5) compare long-term GFAL outcomes to a group receiving booster sessions.

Method

Study Design

The present study was a multisite (five communities), cluster-randomized intervention pilot trial that contrasted the post-intervention long-term effects of the GFAL program (n = 83) with the same program, enhanced with reinforcement follow-up boosters (GFAL-B; n = 93). The unit of randomization was at the community level, conducted prior to the GFAL interventions. Participants who had completed the GFAL program were followed for six and 12-months post-program (Figure 1). The study focus was a convenience sample of 176 generally healthy community-dwelling individuals (mean age 70± 5 years; 62 males, 114 females). A detailed description of the sampling procedures and the GFAL program is provided in Stathokostas et al., 2016. Exclusion criteria consisted of several self-reported conditions: severe heart failure; uncontrolled angina; severe pulmonary disease;

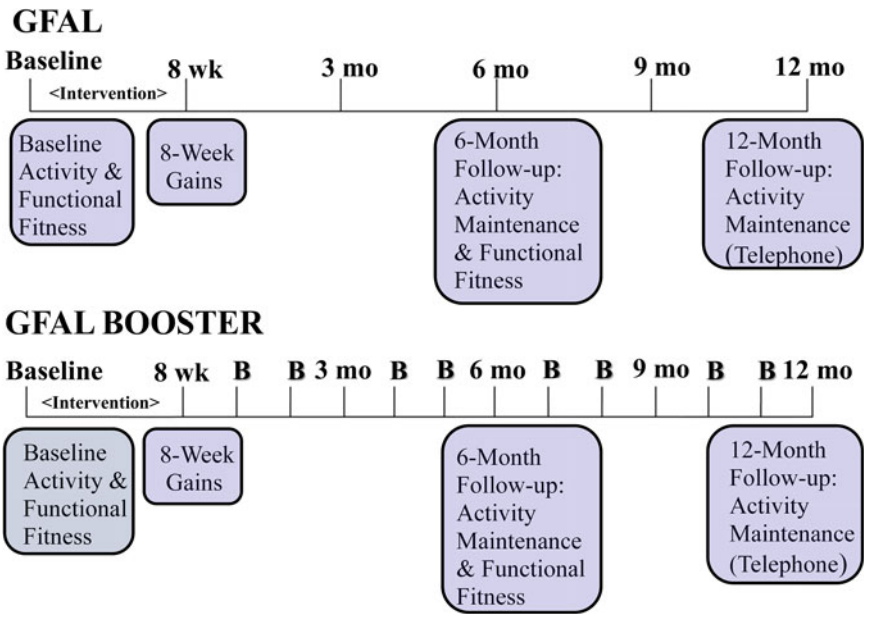

Figure 1: Study design and assessment timelines

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severe arthritis; cancer requiring treatment in the past three years; Parkinson's disease; cognitive impairment; and any other illness that may interfere with physical activity. Criteria also included a summary score of less than 10 on the Short Physical Performance Battery or severe shortness of breath during the 400-meter walk test during baseline testing.

All of the experimental procedures were approved by the Western University Ethics Committee for Research on Human Subjects. All were volunteers and gave written, informed consent to participate in the study.

Intervention

The eight-week community-based group GFAL program was led by local certified GFAL facilitators in each of the five communities. For each of the eight weeks of the program, participants attended three exercise sessions (one hour each) with one session including an additional education session (two hours' duration in total). Education topics included (a) benefits of physical activity, (b) strengthening and stretching, (c) healthy eating, (d) exercise adherence, (e) exercise for various chronic diseases, (f) safety, and (g) maintaining an exercise program at home or in the community. An educational GFAL manual was provided for the participants. The exercise classes included a cardiovascular warm-up; cardiovascular activity at a level that was 65–80 per cent of predicted maximum heart rate; cardiovascular cool-down; muscular strengthening; balance; and flexibility. The program progressed to meet Canada's Physical Activity Guidelines for Older Adults.

The GFAL-Booster (GFAL-B) group participated in the previously described GFAL intervention, which was extended by a series of additional booster sessions provided on a monthly basis during the one-year follow-up. The booster sessions consisted of hard-copy material delivered via postal mail. The content of the boosters was chosen to reinforce the messages provided in the GFAL program and related to participants' maintaining physical activity levels.

Post-program, participants were encouraged to continue their exercise routine on their own and in a setting of their choosing, with no contact from the researchers (aside from follow-up measurements and for those receiving booster sessions).

Assessments

Assessment timelines are presented in Figure 1. Baseline assessments were conducted at the end of the GFAL intervention. Functional and physical fitness follow-up measurements were conducted during the six-month follow-up at the location where the GFAL program took place.

Physical activity levels, exercise participation, self-efficacy, and outcomes expectations were assessed via questionnaire at the six- and 12 month follow-ups. The 12-month follow-up was conducted via telephone by a single research assistant. Assessments were conducted by the same research team involved in the GFAL program assessments for each of the study sites as described by Stathokostas et al., 2016. Research assistants were blinded to the group assignment and had no access to data from any previous data collection time points.

Self-efficacy and Outcomes Expectations

Two measures of self-efficacy were studied: lifestyle self-efficacy and task-specific self-efficacy. Lifestyle self-efficacy was assessed with a five-item survey that indicated the participants' efficacy with respect to continued exercise participation over incremental periods (McAuley, 1993). Task-specific self-efficacy was assessed by three items that asked the participant about the confidence they had in performing both aerobic, and muscle and flexibility, exercises. Participants' self-efficacy was further assessed by confirming that exercise participation would not make physical outcomes worse (Ostir, Cohen-Mansfield, Leveille, Volpato, & Guralnik, 2003). Outcome expectation – the belief that a behaviour will bring about a certain consequence – was assessed with the Multidimensional Outcome Expectations for Exercise Scale (Wójcicki, White, & McAuley, 2009).

Anthropometric Measurements

Height and body mass were measured at baseline (pre-eight-week intervention) and six-month follow-up by means of a standard physician's scale used to calculate body mass index (kg/m^2). Waist and hip circumference (cm) were measured to calculate waist-to-hip ratio.

Physical Function

Physical functioning was assessed using the Short Physical Performance Battery (SPPB) test (Guralnik et al., 1994). The SPPB score is based on timed measures of standing balance, walking speed, and ability to rise from a chair. A summary score ranging from 0 (worst performers) to 12 (best performers) is calculated by adding walking speed, chair stands, and balance scores. The self-paced 400-meter walk (Rejeski et al., 2005) was used to assess lower extremity physical performance and mobility disability.

Physical Fitness

We used four components of the Seniors Fitness Test (SFT) (arm curl, chair sit and reach, back scratch, 8 foot timed up and go) (Rikil & Jones, 2001) to evaluate fitness. Upper body strength was assessed according to

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the number of bicep curls that could be completed in 30 seconds. Lower body flexibility was assessed using the chair sit and reach. To assess upper body flexibility, the back scratch test was utilized. The number of seconds required to get up from a seated position, walk eight feet (2.44m), turn, and return to a seated position (the 8-Foot Up-and-Go test) was used to assess balance and agility.

Physical Activity

The Phone-FITT, a valid and reliable physical activity interview (Gill, Jones, Zou, & Speechley, 2008) designed specifically for community-dwelling older adults, was utilized to assess overall physical activity levels. The Phone-FITT measures frequency, intensity, and duration of household and recreational (including exercise-based) activities.

Exercise Participation

To assess stages of change in exercise participation, we administered the Stages of Change –Short Form at six- and 12 month follow-ups. Participants were presented with the following definition of regular exercise: "…any planned physical activity performed to increase physical fitness. Such activity should be performed at least three times per week with a total of 150-180 minutes per week" (Marcus, Selby, Niaura, & Rossi, 1992, p. 62). Participants were then asked to choose from pre-set response options if they exercised regularly, or not, according to that definition, and we matched responses to scoring corresponding to the transtheoretical model of the stages of change. In addition, participants were asked open-ended questions (Morey et al. 2003) to provide descriptive information regarding the exercise in which they engaged.

Statistical Analysis

Descriptive statistics were conducted for complete pairs, and for the mean with the standard deviation, unadjusted for clustering. We adjusted significance levels comparing data collection time points and booster group comparisons for clustering via the SAS procedure SURVEYMEANS. We conducted Pearson correlations among age, sex, GFAL attendance, all functional and physical fitness variables, and all psychosocial measures to identify determinants of exercise participation at the six- and 12 month follow-ups. We identified determinants of long-term exercise participation with logistic regression (unadjusted) and proc-genmod (adjusted).

Results

Of the total sample who completed the GFAL intervention (n = 176) and were followed prospectively, 95 per cent (n = 168) were retained in the study at the six-month follow-up, and 88 per cent (n = 154) were retained at 12 months (Figure 2). Table 1 presents subject characteristics. Our comparison of those who remained in the study and those who dropped out indicated no significant differences in subject characteristics. There were also no observed significant differences for baseline characteristics of those in the booster arm versus the 126 non-booster arm. The self-reported adherence rate to a structured exercise program at 12-months was 66 per cent (booster and non-booster arms combined).

Functional fitness, physical fitness, and anthropometric measurements from baseline and from the six-month follow-up are presented in Table 2. Participants maintained physical function, as assessed by the SPPB summary score, post-intervention to the six-month follow-up (11.6 ± 0.8 to 11.5 ± 1.0). Although the choice of this battery of tests may have a predisposition for a ceiling effect for the present sample (max score of 12), we found a significant increase in performance on the composite scores of lower body strength (repeated chair stand) and balance after the initial GFAL intervention (11.0 ± 1.1), and found it promising that physical function was maintained at the six-month follow-up. Also maintained were the 400-metre walk time, all anthropometric measurements, and most physical fitness measurements. Only performance in the 8-foot Up-and-Go test decreased as indicated by a slightly longer (but significant) time score (5.9 ± 0.9s to 6.1 ± 1.1s, p = .046). As reported in the description of the eight-week GFAL intervention itself, in contrast to the physical function measures, the physical fitness of the present sample was categorized as average or below average before participation in the GFAL program; reaching 50th to 75th percentile on the physical fitness scores post-intervention. Thus, although physical fitness was maintained, there was still substantial room for improvement to reach levels that would provide a reserve capacity with advancing age.

Exercise Stages of Change

At six months, 62 per cent of participants were in the maintenance stage (Stage Five, "I currently exercise regularly and I have done so for longer than six months"), and 20 per cent were in the action stage (Stage Four, "I currently exercise regularly but I have only begun to do so within the past six months") (Table 3). Of those remaining in the study at the 12-month follow-up, 55 per cent were in the maintenance stage and 12 per cent were in the action stage. Somewhat promising is the observation that at the 12-month follow-up, 22 per cent of those not in the maintenance or action stage reported having relapsed, but only back to the preparation stage (Stage Three, "I currently exercise but not regularly").

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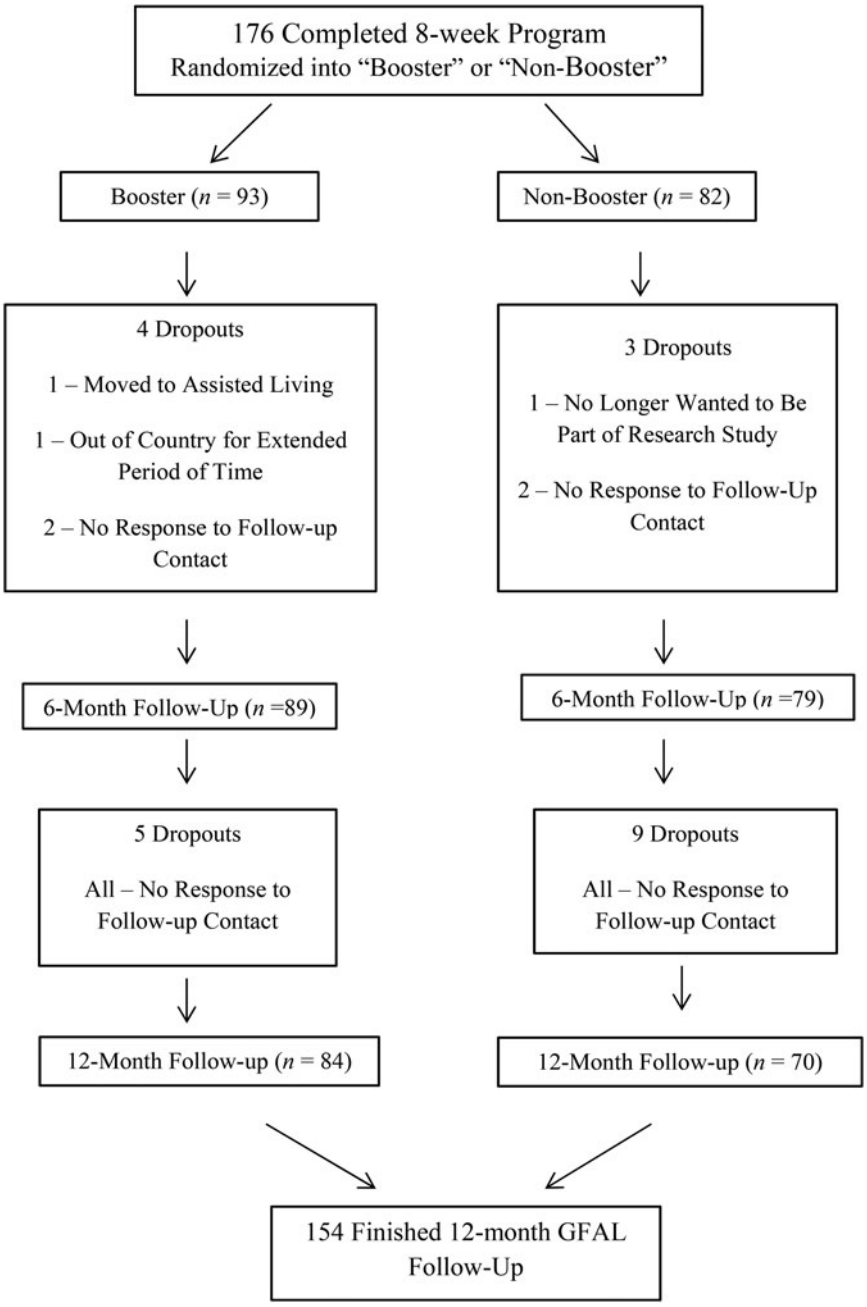

Figure 2: Participant retention flowchart

Description of Exercise Participation

The main reason (45%) for continued exercise participation at the 12-month follow-up was to maintain or increase health (Figure 3). Of those remaining active, 69 per cent continued exercising on their own, post-GFAL intervention (Figure 4), most often outside (39%) or in their homes (35%) (Figure 5). For those who did not continue exercising, illness (38%) and lack of motivation (32%) were cited as the main reasons for non-adherence. Of those reporting illness as the main reason for non-participation in exercise, four reported musculoskeletal issues (not related to exercise), one reported having a stroke within the first six months post-intervention, one reported eye surgery in the six- to 12-month follow-up period, two reported being diagnosed with cancer, and the rest were undisclosed illnesses.

Physical Activity Participation

Because of missing data in the reporting of either frequency, duration, or intensity of activities listed in the PhoneFITT, complete data were available for

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Table 1: Subject characteristics at baseline, six-, and 12-month follow-ups

Characteristics	Baseline (from overall project baseline, not 8-wk) *n* = 176			Completed 6-Month Follow-up *n* = 168 (96%)				Completed 12-Month Follow-up *n* = 154 (88%)	
	Total	Booster (*n* = 93)	Non-booster (*n* = 82)		Total	Booster (*n* = 93)	Non-booster (*n* = 82)		Total
Age (y)				**Age (y)**				**Age (y)**	
Total	70.3 ± 5.3	68.9 ± 4.7	71.9 ± 5.5	**Total**	70.3 ± 5.3	68.9 ± 4.7	71.9 ± 5.5	**Total**	70.3 ± 5.3
Males	72.2 ± 5.2			Males	72.2 ± 5.2			Males	72.2 ± 5.2
Females	69.4 ± 5.1			Females	69.4 ± 5.1			Females	69.4 ± 5.1
Gender				**Gender**				**Gender**	
Males	62	25	37	Males	62	25	37	Males	62
Females	114	68	45	Females	114	68	45	Females	114
Race				**Race**				**Race**	
White	158	83	75	White	158	83	75	White	158
African/American Black	4	2	2	African/American Black	4	2	2	African/American Black	4
Asian	4	2	2	Asian	4	2	2	Asian	4
Aboriginal	3	3	3	Aboriginal	3	3	3	Aboriginal	3
East/West Indian	3	1	2	East/West Indian	3	1	2	East/West Indian	3
Other	1	0	1	Other	1	0	1	Other	1
Marital Status				**Marital Status**				**Marital Status**	
Never legally married	12	6	6	Never legally married	12	6	6	Never legally married	12
Legally married	97	47	50	Legally married	97	47	50	Legally married	97
Separated	6	4	2	Separated	6	4	2	Separated	6
Divorced	29	18	11	Divorced	29	18	11	Divorced	29
Widowed	31	17	14	Widowed	31	17	14	Widowed	31
Education				**Education**				**Education**	
Some secondary/ high school	38	20	18	Some secondary/ high school	38	20	18	Some secondary/ high school	38
Secondary (high) school or equivalency	25	13	12	Secondary (high) school or equivalency	25	13	12	Secondary (high) school or equivalency	25
Registered apprenticeship or trades certificate/ diploma	14	6	8	Registered apprenticeship or trades certificate/ diploma	14	6	8	Registered apprenticeship or trades certificate/ diploma	14
Some post-secondary	23	13	10	Some post-secondary	23	13	10	Some post-secondary	23
College/university degree/diploma	58	31	26	College/university degree/diploma	58	31	26	College/university degree/diploma	58
Graduate/professional degree	15	8	7	Graduate/professional degree	15	8	7	Graduate/professional degree	15

Continued

Table 1: Continued

Characteristics	Baseline (from overall project baseline, not 8-wk) *n* = 176			Completed 6-Month Follow-up *n* = 168 (96%)				Completed 12-Month Follow-up *n* = 154 (88%)	
	Total	Booster (*n* = 93)	Non-booster (*n* = 82)		Total	Booster (*n* = 93)	Non-booster (*n* = 82)		Total
Age (y)				**Age (y)**				**Age (y)**	
Retirement Status				**Retirement Status**				**Retirement Status**	
Fully retired	140	71	69	Fully retired	140	71	69	Fully retired	140
Semi-retired	27	17	9	Semi-retired	27	17	9	Semi-retired	27
Unemployed	1	1	0	Unemployed	1	1	0	Unemployed	1
Not retired	5	1	4	Not retired	5	1	4	Not retired	5
Self-Rated Health				**Self-Rated Health**				**Self-Rated Health**	
Excellent	15	7	8	Excellent	15	7	8	Excellent	15
Very good	73	34	39	Very good	73	34	39	Very good	73
Good	69	46	23	Good	69	46	23	Good	69
Fair	17	5	12	Fair	17	5	12	Fair	17
Number of Health Conditions				**Number of Health Conditions**				**Number of Health Conditions**	
0	53	29	24	0	53	29	24	0	53
1	47	29	18	1	47	29	18	1	47
2	48	22	26	2	48	22	26	2	48
>3	24	12	12	>3	24	12	12	>3	24
Prevalent Health Conditions				**Prevalent Health Conditions**				**Prevalent Health Conditions**	
Hypertension	42			Hypertension	42			Hypertension	42
Arthritis	25			Arthritis	25			Arthritis	25
Thyroid	14			Thyroid	14			Thyroid	14
Hyperlipidemia	15			Hyperlipidemia	15			Hyperlipidemia	15
Type II Diabetes	12			Type II Diabetes	12			Type II Diabetes	12
Osteoarthritis	6			Osteoarthritis	6			Osteoarthritis	6
Glaucoma	7			Glaucoma	7			Glaucoma	7
Gastric Reflux	4			Gastric Reflux	4			Gastric Reflux	4
Fibromyalgia	2			Fibromyalgia	2			Fibromyalgia	2
Depression	1			Depression	1			Depression	1
Rheumatoid Arthritis	2			Rheumatoid Arthritis	2			Rheumatoid Arthritis	2
BMI	28.7 ± 5.4	29.6 ± 5.7	27.8 ± 4.9	**BMI**	28.7 ± 5.4	29.6 ± 5.7	27.8 ± 4.9	**BMI**	28.7 ± 5.4

BMI = body mass index

Table 2: Change in functional, physical fitness, and anthropometric measures at six-month follow-up

Variable	TOTAL			Booster			Non-Booster		
	Baseline (8 Week)	6 Month	Change	Baseline (8 Week)	6 Month	Change	Baseline (8 Week)	6 Month	Change
Functional Fitness									
SPPB Summary Score (max 12)	11.6 (0.8)	11.5 (1.0)	0.04 (1.0)	11.6 (0.7)	11.7 (0.8)	–0.04 (0.8)	11.4 (0.8)	11.3 (1.2)	0.16 (1.2)
Repeat Chair Stands (s)	10.0 (2.8)	9.8 (2.9)	0.5 (2.2)	10.0 (2.6)	9.1 (2.5)	0.9* (1.7)	10.6 (2.5)	10.6 (3.0)	–.006 (2.7)
8-Foot Walk Speed (m/s)	1.3 (0.3)	1.5 (0.4)	–0.2 (0.4)	1.4 (0.3)	1.5 (0.4)	–0.13 (0.4)	1.2 (0.24)	1.37 (0.28)	–0.18 (0.3)
Balance Ordinal Score	3.92 (0.33)	3.8 (0.5)	–1.1 (0.6)	3.9 (0.2)	3.9 (0.5)	–0.1 (0.5)	4.0 (0.2)	3.7 (0.6)	–0.2 (0.6)
400-Metre Walk Time (s)	5.1 (0.8)	5.1 (0.9)	–0.02 (0.5)	5.0 (0.8)	5.0 (0.9)	0.02 (0.2)	5.2 (0.8)	5.2 (0.8)	0.01 (0.43)
Physical Fitness									
8-Foot Timed Up & Go (s)	5.9 (0.9)	6.1 (1.1)	–0.2* (0.7)	5.7 (0.9)	6.0 (1.1)	–0.31 (0.74)	6.2 (0.9)	6.3 (1.1)	–0.14 (0.7)
Arm Curls (# in 30 s)	17.3 (4.4)	17.0 (3.9)	0.3 (4.2)	17.5 (4.4)	17.5 (4.2)	–0.02 (4.4)	16.9 (4.4)	16.1 (3.0)	0.81 (3.98)
Chair Sit & Reach (cm)	2.3 (8.4)	3.2 (8.2)	–0.9 (7.4)	2.9 (8.2)	4.4 (7.8)	–1.58 (8.18)	1.6 (8.7)	1.4 (8.5)	0.19 (6.08)
Back Scratch (cm)	–5.4 (10.0)	–5.9 (11.4)	0.45 (6.8)	–5.6 (9.4)	–5.5 (11.0)	–0.17 (5.4)	–5.13 (11.00)	–6.5 (12.1)	1.41 (8.59)
Anthropometrics									
Weight (kg)	77.1 (15.1)	76.6 (15.3)	–0.5 (2.3)	76.7 (14.3)	77.5 (14.9)	0.49 (2.7)	75.6 (15.7)	75.1 (16.0)	0.47 (1.55)
BMI (kg/m2)	28.2 (4.4)	28.8 (6.4)	0.6 (4.9)	28.6 (4.6)	29.3 (6.5)	–0.63 (5.2)	27.5 (4.3)	28.1 (6.2)	–0.63 (4.62)
Waist Circumference (cm)	94.2 (12.3)	94.3 (15.3)	–0.1 (11.0)	94.0 (12.0)	94.9 (12.5)	–0.25 (5.1)	93.3 (12.6)	93.3 (19.1)	0.19 (16.6)
Waist-Hip Ratio	0.9 (0.1)	0.9 (0.1)	0.0 (0.1)	0.89 (0.10)	0.88 (0.09)	0.01 (0.08)	0.90 (0.10)	0.88 (0.15)	0.02 (0.156)

*** $p < .05$; standard deviations have not been adjusted for clustering**
BMI = body mass index

84 individuals with a total score of 67.4 ± 19 at baseline (eight weeks). For the six- and 12-month follow-ups, 105 and 126 paired samples were available for analyses, respectively. At the six-month follow-up, the total physical activity score had dropped significantly ($p < .001$) to 59.8 ± 17.9, but remained elevated to baseline (pre-intervention) levels. By the 12-month follow-up, the total physical activity score (54.6 ± 15.5) showed a trend for a continued decline in physical activity participation; approaching baseline (pre-intervention) levels.

No differences between booster and non-booster arms were observed for physical function, physical fitness, or anthropometric measurements at baseline or six-month follow-up. The only difference observed between groups was an improvement in repeated chair stand time for the booster group (10.0 ± 2.6s to 9.1 ± 2.5s). With respect to changes by sex, men showed a significant increase in 8-foot walk time and speed performances (Table 4a). Among women, repeated chair stands time significantly decreased, indicating an increase in lower body strength (10.2 ± 2.7 to 9.4 ± 2.4 seconds) and a significant decrease in body weight (72.1 ± 12.2kg to 71.3 ± 11.8kg) was also observed (Table 4b). Self-efficacy and outcome expectations over the six-month period are presented in Table 5. Post-intervention, both task-specific and lifestyle self-efficacy decreased significantly by the six-month follow-up and were then maintained at the 12-month follow-up. Outcomes expectations did not change at the six- and 12-month follow-ups.

Determinants of Exercise Participation

Correlation comparisons revealed that only pre-GFAL task-specific and lifestyle self-efficacy, and changes in these two variables at six-month follow-up were associated with six-month exercise participation. Similarly, only pre-GFAL task-specific and lifestyle self-efficacy were correlated to exercise participation at the 12-month follow-up. These variables were entered into logistic

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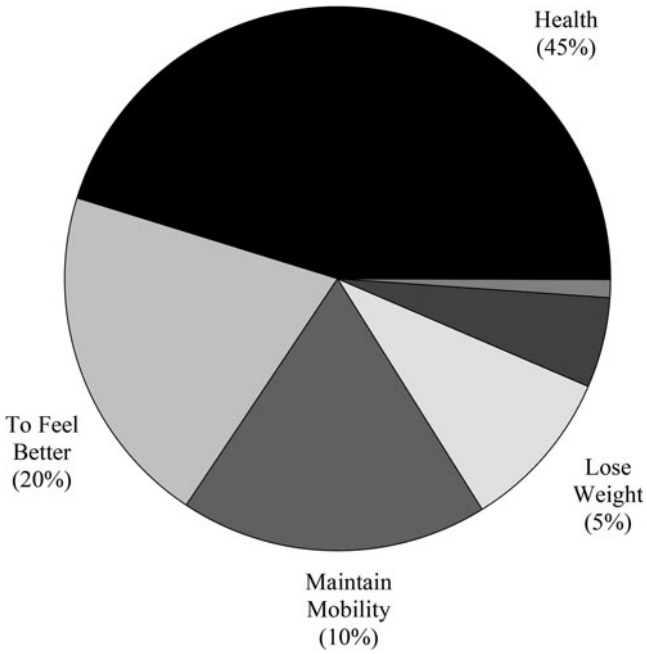

Figure 3: Main reason for continued exercise participation at 12 months

regression in order to identify determinants of six- and 12-month exercise participation. Task-specific self-efficacy at completion of the GFAL program ($p = .006$), at month six ($p < .001$), and the change from GFAL completion to six-month follow-up ($p < .001$) were significant determinants of exercise participation at the six-month follow-up. Also, a significant determinant of exercise participation at six months was lifestyle self-efficacy at completion of the GFAL program ($p < .001$), at month six ($p < .001$), and the change from GFAL completion to six-month follow-up ($p < .001$). At the 12-month follow-up, pre-GFAL task-specific ($p = .002$) and lifestyle self-efficacy ($p = .01$) were revealed to be

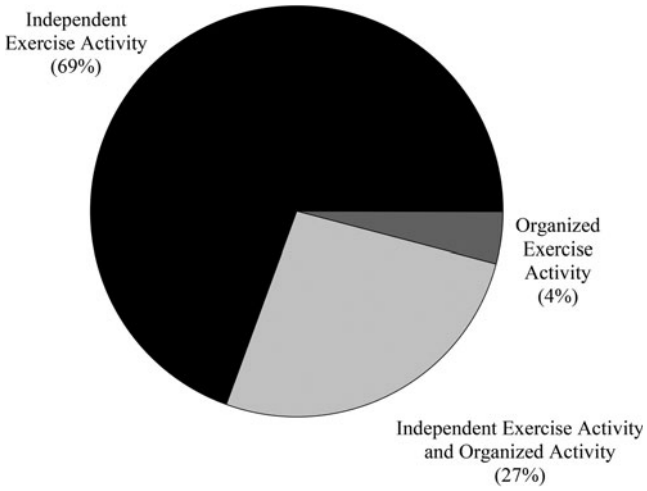

Figure 4: Type of exercise participation at 12 months

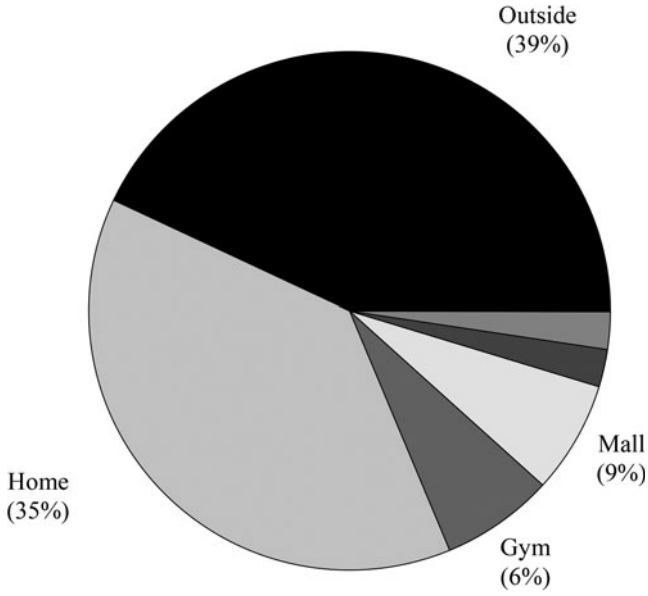

Figure 5: Location, by percentage of study participants of primary independent exercise activity

significant determinants of 12-month exercise participation. Post-GFAL, six- and 12-month task-specific and lifestyle self-efficacy were also significant determinants of exercise participation ($p < .001$).

Discussion

The GFAL pilot intervention indicated promise in increasing physical activity adherence, but more importantly, specifically exercise adherence, corresponding to the current older adult guidelines. Of those remaining in the study at 12 months, 66 per cent were exercising (maintenance and action stages combined). In addition, participation in exercise type activities, but not meeting the defined exercise criteria, was reported by 92 per cent of the sample at the 12-month follow-up. However, it is acknowledged that self-reported physical activity levels have been shown to be overestimated versus objective measures in population-based studies (Bassett, 2012). Colley et al. (2011) reported that 13 per cent of Canadians aged 60 to 79 years were meeting Canada's Physical Activity Guidelines based on objective measures of physical activity; although the present sample had completed an exercise intervention in the year previous, we can reasonably assume the self-reported higher percentage of 66 per cent to be inflated.

Recent evidence, however, has emerged in the support of higher exercise participation rates post-exercise intervention. Baruth and Wilcox (2013) reported the findings of a six-month follow-up for two older-adult community-based physical activity interventions (Active Living Every Day [ALED] and Active Choices [AC]).

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Table 3: Exercise stage of change at 6- and 12-month follow-up (participation in regular exercise, 3 to 5 times per week, for 20-60 minutes)

Stage	6-Month Follow-up (since 8-week program)	12-Month Follow-up (since 6-month follow-up)
Maintenance Yes, I have been exercising for the past 6 months	**104**	**84**
Action Yes, I have been exercising for fewer than 6 months	**32**	**18**
Preparation No, but I intend to exercise in the next 30 days	**16**	**34**
Contemplation No, but I intend to exercise in the next 6 months	**10**	**9**
Precontemplation No, and I do not intend to exercise in the next 6 months	***7***	**9**
Subtotal	**169**	**154**
Dropouts	***7***	**15**
Total	**176**	**169**

Participants were classified as meeting or not meeting PA recommendations (≥ 30 min/day, ≥ 5 day/week), and it was reported that for both interventions, 40 per cent of participants met physical activity recommendations at the six-month follow-up. It should be noted that Baruth and Wilcox (2013) also reported that participants in the AC and ALED programs meeting PA recommendations at the end of the intervention were also more likely to meet recommendations at the six-month follow-up, and highlighted the importance of ensuring the adoption of regular physical activity prior to the end of an active intervention period. The GFAL program aligns with this identified strategy as the program provides an introduction to the current physical activity guidelines and gradually increases activity of the exercise sessions to meet these guidelines by the end of the intervention. Accordingly, physical activity promotion strategies should not only focus on awareness of physical activity guidelines, but should also stress that older adults meet those guidelines in order to assist with long-term adherence.

With respect to broader physical activity participation, the results of the physical activity questionnaire indicated that total physical activity of the sample declined steadily approaching baseline (pre-intervention); and

Table 4a: Change in functional, physical fitness, and anthropometric measures at six-month follow-up in men

Variable	Time			Difference	*p* value	95% CI
	n	Week 8	Month 6			
SPPB Summary Score	33	11.5 (0.8)	11.2 (1.4)	0.36 (1.34)	.242	(–0.29, 1.02)
400-Metre Walk Time	36	5.1 (0.8)	5.0 (0.8)	0.02 (0.39)	.836	(–0.17, 0.21)
8-Foot Walk Time	35	1.9 (0.4)	1.6 (0.4)	0.29 (0.46)*	.039	(0.02, 0.56)
8-Foot Walk Speed	35	1.3 (0.3)	1.6 (0.4)	–0.26 (0.37)*	.027	(–0.48, –0.04)
Repeat Chair Stands Time	36	10.4 (2.4)	10.2 (3.4)	0.22 (2.83)	.779	(–1.50, 1.95)
8-Foot Timed Up & Go Best Score	36	6.1 (1.0)	6.3 (1.2)	–0.21 (0.69)	.081	(–0.45, 0.03)
Arm Curls	35	17.8 (4.5)	17.5 (4.0)	0.23 (4.32)	.774	(–1.50, 1.96)
Chair Sit & Reach	36	–0.3 (7.3)	–0.1 (8.6)	–0.11 (8.17)	.953	(–4.26, 4.04)
Back Scratch	36	–11.5 (11.2)	–11.9 (12.4)	0.42 (9.18)	.779	(–2.80, 3.63)
Weight	36	86.0 (15.8)	86.0 (16.6)	–0.03 (2.56)	.946	(–0.92, 0.86)
BMI	36	28.8 (4.5)	28.8 (5.0)	–0.08 (1.48)	.787	(–0.72, 0.56)
Waist Circumference	36	101.4 (11.7)	99.8 (19.4)	1.63 (16.89)	.589	(–4.86, 8.11)
Hip Circumference	36	105.2 (9.2)	106.5 (8.2)	–1.32 (4.35)	.225	(–3.59, 0.95)
Waist-Hip Ratio	36	0.96 (0.07)	0.94 (0.16)	0.03 (0.16)	.325	(–0.03, 0.09)

*** $p < .05$; standard deviations have not been adjusted for clustering**
BMI = body mass index
SPPB = Short Physical Performance Battery

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Table 4b: Change in functional, physical fitness, and anthropometric measures at six-month follow-up in women

Variable		Time		Difference	*p* value	95% CI
	n	Week 8	Month 6			
SPPB Summary Score	61	11.6 (0.8)	11.7 (0.6)	–0.13 (0.59)	.124	(–0.31, 0.04)
400-Metre Walk Time	63	5.1 (0.8)	5.1 (0.9)	0.02 (0.48)	.811	(–0.14, 0.17)
8-Foot Walk Time	61	1.9 (0.4)	1.8 (0.5)	0.09 (0.47)	.336	(–0.11, 0.28)
8-Foot Walk Speed	61	1.3 (0.3)	1.4 (0.3)	–0.09 (0.34)	.241	(–0.24, 0.07)
Repeat Chair Stands Time	63	10.2 (2.7)	9.4 (2.4)	0.71 (1.77)*	.027	(0.10, 1.33)
8-Foot Timed Up & Go Best Score	63	5.8 (0.9)	6.1 (1.1)	–0.26 (0.75)	.121	(–0.60, 0.08)
Arm Curls	63	17.0 (4.4)	16.7 (3.8)	0.33 (4.19)	.713	(–1.63, 2.30)
Chair Sit & Reach	63	3.8 (8.7)	5.2 (7.3)	–1.32 (7.02)	.204	(–3.48, 0.84)
Back Scratch	64	–2.0 (7.3)	–2.5 (9.3)	0.46 (5.12)	.637	(–1.65, 2.57)
Weight	64	72.1 (12.2)	71.3 (11.8)	0.76 (2.15)*	.027	(0.10, 1.42)
BMI	64	27.8 (4.4)	28.8 (7.0)	–0.94 (6.06)	.294	(–2.84, 0.95)
Waist Circumference	64	90.1 (10.7)	91.2 (11.6)	–1.04 (5.51)	.263	(–3.00, 0.92)
Hip Circumference	64	105.5 (10.5)	106.8 (9.3)	–1.29 (5.53)	.161	(–3.19, 0.61)
Waist-Hip Ratio	64	0.86 (0.09)	0.85 (0.07)	0.00 (0.08)	.726	(–0.02, 0.03)

*** $p < .05$; standard deviations have not been adjusted for clustering**
BMI = body mass index
SPPB = Short Physical Performance Battery

this was mostly a result of non-recreational/exercise type physical activities. Although it has been previously observed that structured exercise programs can result in a decrease in total physical activity, there does exist the possibility that seasonality may have been a factor in this observation. For example, almost all of the sites of the present study experience severe fluctuations in weather (hot summer, cold winter), and for three sites, the 12-month follow-up occurred well into the winter months; likely influencing reporting the physical activities of gardening, outdoor home maintenance, and so on.

Perhaps more important than absolute adherence rates to exercise is whether the desired health and functional outcomes are achieved. In the present study, functional and physical fitness outcomes gained during the eight-week GFAL program were maintained at the six-month follow up. Although it was encouraging that these gains were maintained, the description of the post-eight-week GFAL intervention functional and physical fitness measures (Stathokostas et al., 2016) would indicate that, based on comparison to population normative data, the present sample did have room for improvement in testing scores, and, therefore, the volume and intensity of exercise participation needs to be reinforced both during the GFAL program and in maintenance strategies. Also, future interventions should include longer-term (12-month and beyond) functional and physical fitness measurements in order to determine if reported exercise activities are of sufficient intensity to counter yearly age-related physiological declines. A slower 12-month rate of decline in SPPB score was reported by Rejeski et al. (2009) for the 36-month follow-up of the LIFE-P Study and by Simonsick et al. (2005) for a sample of walkers and non-walkers. The present results for functional outcomes are reported only for the six-month

Table 5: Change in psychosocial variables from baseline to six- and 12-month follow-ups

	TOTAL			Booster			Non-booster		
Variable	Baseline (Week 8)	6-Month	12-Month	Baseline	6-Month	12-Month	Baseline	6-Month	12-Month
Task-specific self-efficacy (max 30)	25.1 (3.7)	22.9* (5.3)	22.7 (5.1)	25.4 (3.5)	23.2 (4.9)	22.6 (5.2)	24.6 (3.8)	22.4 (5.8)	23.0 (4.9)
Lifestyle self-efficacy (max 100)	81.3 (17.0)	75.6* (22.0)	74.6 (23.9)	82.3 (15.8)	74.6 (22.7)	74.1 (24.0)	79.2 (19.8)	77.0 (21.5)	75.1 (24.2)
Outcomes expectations (max 75)	65.5 (6.5)	64.2 (9.8)	65.5 (6.6)	64.8 (6.7)	64.2 (10.7)	66.3 (6.1)	64.8 (6.7)	64.3 (8.8)	65.0 (7.1)

*** $p < .05$; standard deviations have not been adjusted for clustering**

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period post-intervention, but they are the first to show that functional and physical fitness can be maintained via nonsupervised exercise participation.

Health as a leading motivator for initiating and maintaining exercise has been previously reported for older adults (Cohen-Mansfield, Marx, & Guralnik, 2003; Costello, Kafchinski, Vrazel, & Sullivan, 2011; O'Neill & Reid, 1991). The association has also been shown to be stronger among older adult samples reporting a high rate of health problems and a barrier in inactive samples (O'Neill & Reid, 1991). In the present relatively healthy community-dwelling sample, health was by far the most frequently reported reason for continued exercise participation (45%), with the second most common reason being "to feel better" (20%). As such, these self-reported motivators for continued exercise participation should be included and promoted when advocating for physical activity in the older adult population.

The present study also provides insight into the characteristics of the exercise activities of those who adhered to an exercise program. One goal of the GFAL program was to increase the fitness, knowledge, and confidence of older adults so that they may continue exercise participation in the venue of their choice post-program. The results of this study indicate that the routine of exercise adherence was most often continued by the individual without the need of an organized group program, with 69 per cent reporting exercising independently. King et al. (2000) showed greater adherence to a home-based program versus a group-based program. It has also been suggested that providing choices concerning exercise programming can contribute to greater adherence (Cress et al., 2004). These findings have implications for professionals involved in physical activity promotion for older adults. Although some older adults value the social aspect of their exercise mode choices, it cannot be assumed that this strategy will appeal to all older adults, and the availability of individual physical activity resources and qualified fitness instructors for various settings is needed.

Poor health or illness has previously been reported as the main reason why older adults discontinue participation in their exercise program (Morey et al., 2003). Illness was reported by 38 per cent of non-adherent participants in the present study. Although this study does not have information as to whether those who reported illness ever did resume their exercise routine, future investigations should document this factor, and develop and promote strategies to assist older adults to resume exercise (that is, relapse prevention efficacy). It should be noted that increased fitness is associated with an increased reserve capacity of physiological systems, and that those who are fit are at a decreased risk of losing their functional independence due to an illness versus those who are unfit (Graf, 2006). Increased physical fitness, therefore, may aid in the return to an exercise routine.

Lack of motivation was reported as the second most common reason (32%) reported by non-adherents in the study. Self-motivation is an independent psychosocial variable that includes efficacy beliefs about personal abilities and tendencies to set goals with an emphasis on effort and persistence after a goal has been set. A specific variable to assess motivation was not included. However, it has been reasoned that because self-regulatory traits like self-motivation influence decisions regarding adoption of, and adherence to, volitional behaviors, self-motivation could be associated with stages of behavior change defined by the transtheoretical model, which has been used to describe health-behavior change, including exercise (Andre & Dishman, 2012). Note that the "lack of motivation" category was formulated on the basis of an open-ended question, and so a participant's perception of motivation may be different than the variable identified by the literature. Regardless, these results suggest that physical activity interventions should include long-term motivation strategies and provide motivational reinforcement resources.

Self-efficacy has been found to predict, explain, and produce change in physical activity behaviour (McAuley, 1993). The confidence of the participants to accumulate physical activity (lifestyle self-efficacy) was unchanged by the GFAL intervention, and decreased significantly post-intervention at six and 12 months. This measure may have been influenced by seasonal differences and the scheduling of vacations or upcoming surgeries of family members. Personal communications with research assistants across the various study sites revealed that many participants were unsure as to how to answer this question depending on their upcoming schedule. This may indicate that interventions and maintenance strategies are needed that include skills to deal with planned and unexpected changes in schedules. Baseline and change in post-intervention self-efficacy (confidence in being able to be regularly active) was found to significantly predict physical activity participation six months' post-intervention in the Active Living Every Day group behavioural-based program (Baruth et al. 2011). However, Baruth and Wilcox (2013) also reported that self-efficacy six months after the AC telephone-delivered physical activity intervention did not predict physical activity adherence.

Outcomes expectations did not show any change for either follow-up time point; as indicated in our eight-week program evaluation, the present sample may have had initially high outcomes expectations at

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the onset of the GFAL program. In the present study, task-specific and lifestyle self-efficacy were the only measures (psychosocial or other) that significantly predicted long-term adherence to exercise participation. As indicated earlier, lifestyle self-efficacy was not significantly changed after participation in the GFAL intervention. Task-specific self-efficacy was significantly increased post-GFAL but significantly decreased at the six-month follow-up and remained at that level at the 12-month follow-up. A goal of the GFAL is to increase an individual's confidence in performing various types of physical activities so that they will continue with their exercise program assisted by their newly acquired skills. However, our results indicate that task-specific self-efficacy was not maintained long-term, and this significantly influenced the six- and 12-month exercise participation. As a majority of the present sample reported exercising independently post-GFAL, the decline in task-specific self-efficacy is perhaps not surprising and would suggest that in-person skills reinforcement booster sessions may be an appropriate strategy for long-term maintenance.

Booster Sessions

Factors related to long-term exercise adherence facilitation post-intervention include reinforcement strategies, also known as boosters. A recent systematic review of all age groups suggests that while quality evidence is limited in describing the effectiveness of this maintenance strategy, there is a trend for a positive association with the use of booster sessions, but that the type of booster session (print, telephone, etc.) that is most effective also requires more investigation (Muller-Riemenschneider, Reinhold, Nocon, & Willich, 2008). Currently, nothing indicates the effectiveness of booster sessions in older adults, although it has been suggested that older adults respond similarly to print and telephone booster formats (Marcus et al. 2007). In the present study, there was no difference in changes to functional and fitness outcomes or psychosocial variables, nor in adherence to physical activity based on booster assignment. This result may be a reflection of the print-based booster and its content. An alternative explanation for this observation, however, may be that in the present study there was sufficient contact by the researchers over the 12-month follow-up (e.g., six-month follow-up, or five- and 11-month reminders of upcoming follow-ups) that the non-booster group may have been similarly influenced by a sense of obligation to the research project versus receiving boosters. However, although new strategies, such as personal technologies and personal coaching are currently being investigated, the present results would suggest that long-term adherence in older adults is not influenced by booster sessions.

Limitations/Strengths/Future Directions

Larger-scale interventions are needed to conduct both a process and program evaluation to identify multi-level determinants of long-term adherence to an exercise program in the older adult population.

The GFAL pilot project provided positive results for a sustainable, evidence-informed, educational, and experiential program that can be disseminated and widely serve as a model for community-based older-adult exercise programs in Canada.

References

Andre, N., & Dishman, R. K. (2012). Evidence for the construct validity of self-motivation as a correlate of exercise adherence in French older adults. *Journal of Aging and Physical Activity*, *20*, 231–245.

Baruth, M. & Wilcox, S. (2013). Predictors of physical activity 6-months post intervention in the active for life initiative. *Journal of Physical Activity and Health*, *11*(2), 256–65.

Baruth, M., Wilcox, S., Wegley, S., Buchner, D. M., Ory, M. G., Phillips, A., ... & Bazzarre, T. L. (2011). Changes in physical functioning in the active living every day program of the active for life initiative. *International Journal of Behavioral Medicine*, *18*(3), 199–208.

Bassett, D. R. (2012). Device-based monitoring in physical activity and public health research. *Physiological Measurement*, *33*, 1769–1783.

Cohen-Mansfield, J., Marx, M. S., & Guralnik, J. M. (2003). Motivators and barriers to exercise in an older community-dwelling population. *Journal of Aging and Physical Activity*, *11*, 242–253.

Colley, R. C., Garriguet, D., Janssen, I., Craig, C. L., Clarke, J., & Tremblay, M. S. (2011). Physical activity of Canadian adults: Accelerometer results from the 2007 to 2009 Canadian Health Measures Survey. *Statistics Canada Health Reports*, Vol. 22(1). http://www.statcan.gc.ca/pub/82-003-x/2011001/article/11396-eng.htm

Conn, V. S., Minor, M. A., Burks, K. J., Rantz, M. J., & Pomeroy, S. H. (2003). Integrative review of physical activity intervention research with aging adults. *Journal of the American Geriatrics Society*, *51*, 1159–1168.

Costello, E., Kafchinski, M., Vrazel, J., & Sullivan, P. (2011). Motivators, barriers, and beliefs regarding physical activity in an older adult population. *Journal of Geriatric Physical Therapy*, *34*, 138–147.

Cress, M. E., Buchner, D., Rimmer, J., Prohaska, T., Brown, M., Macera, C., ... & Chodzko-Zajko, W. (2004). Physical activity programs and behaviour counselling in older adult populations. *Medicine and Science in Sports and Exercise*, *36*(11), 1997–2003.

Gill, D. P., Jones, G. R., Zou, G. Y., & Speechley, M. (2008). The Phone-FITT: A brief physical activity interview for

older adults. *Journal of the American Planning Association*, *16*, 292–315.

Graf, C. (2006). Functional decline in hospitalized older adults. *The American Journal of Nursing*, *106*, 58–67.

Guralnik, J. M., Simonsick, E. M., Ferrucci, L., Glynn, R. J., Berkman, L. F., Blazer, D. G., ... &Wallace, R. B. (1994). A short physical performance battery assessing lower extremity function: association with self-reported disability and prediction of mortality and nursing home admission. *Journal of Gerontology*, *49*(2), M85–M94.

King, A. C., Puglisi, C. M., Phillips, W., Oka, R., Rodenburg, A., & Haskell, W. L. (2000). Comparative effects of two physical activity programs on measured and perceived physical functioning and other health-related quality of life outcomes in older adults. *Journals of Gerontology Series A: Biological Sciences and Medical Sciences*, *55*, M74–M83.

Marcus, B. H., Napolitano, M. A., King, A. C., Lewis, B. A., Whiteley, J. A., Albrecht, A., ... & Jakicic, J. (2007). Telephone versus print delivery of an individualized motivationally tailored physical activity intervention: Project STRIDE. *Health Psychology*, *26*(4), 401.

Marcus, B. H., Selby, V. C., Niaura, R. S., & Rossi, J. S. (1992). Self-efficacy and the stages of exercise behavior change. *Research Quarterly for Exercise and Sport*, *63*, 60–66.

Marcus, B. H., Williams, D. M., Dubbert, P. M., Sallis, J. F., King, A. C., Yancey, A. K., … & Claytor, R. P. (2006). Physical Activity Intervention Studies. *Circulation*, *114*, 2739–2752.

McAuley, E. (1993). Self-efficacy and the maintenance of exercise participation in older adults. *Journal of Behavioral Medicine*, *16*, 103–113.

Morey, M. C., Dubbert, P. M., Doyle, M. E., MacAller, H., Crowley, G. M., Kuchibhatla, M., … & Horner, R. D. (2003). From supervised to unsupervised exercise: Factors associated with exercise adherence. *Journal of Aging and Physical Activity*, *11*, 351–368.

Muller-Riemenschneider, F., Reinhold, T., Nocon, M., & Willich, S. N. (2008). Long-term effectiveness of interventions promoting physical activity: A systematic review. *Preventive Medicine*, *47*, 354–368.

O'Neill, K., & Reid, G. (1991). Perceived barriers to physical activity by older adults. *Canadian Journal of Public Health*, *82*, 392–396.

Ostir, G. V., Cohen-Mansfield, J., Leveille, S., Volpato, S., & Guralnik, J. M. (2003). The association of positive and negative affect and exercise self-efficacy in older adults. *Journal of Aging and Physical Activity*, *11*, 265–274.

Rejeski, W. J., Marsh, A. P., Chmelo, E., Prescott, A. J., Dobrosielski, M., Walkup, M. P., ... & Kritchevsky, S. (2009). The lifestyle interventions and independence for elders pilot (LIFE-P): 2-year follow-up. *The Journals of Gerontology Series A: Biological Sciences and Medical Sciences*, *64*(4), 462–467.

Rejeski, W. J., Fielding, R. A., Blair, S. N., Guralnik, J. M., Gill, T. M., Hadley, E. C., ... & Pahor, M. (2005). The lifestyle interventions and independence for elders (LIFE) pilot study: Design and methods. *Contemporary clinical trials*, *26*(2), 141–154.

Rikil, R. E., & Jones, C. J. (2001). *Senior Fitness Test Manual*. Champaign, IL: Human Kinetics.

Simonsick, E. M., Guralnik, J. M., Volpato, S., Balfour, J., & Fried, L. P. (2005). Just get out the door! Importance of walking outside the home for maintaining mobility: Findings from the women's health and aging study. *Journal of the American Geriatric Society*, *53*, 198–203.

Stathokostas, L., Speechley, M., Little, R. M. D., Doerksen, S., & Paterson, D. H. (2016). *The Get Fit for Active Living demonstration project: Evaluation of a Canadian older adult physical activity education program*. Evaluation report submitted to the Canadian Centre for Activity and Aging. London, ON: Western University. Retrieved from https://www.researchgate.net/publication/301221346_The_Get_Fit_for_Active_Living_Demonstration_Project_Evaluation_of_a_Canadian_Older_Adult_Physical_Activity_Education_Program

Wilcox, S., Dowda, M., Griffin, S. F., Rheaume, C., Ory, M. G., Leviton, L., … & Estabrooks, P. A. (2006). Results of the first year of active for life: Translation of 2 evidence-based physical activity programs for older adults into community settings. *American Journal of Public Health*, *96*(7), 1201–1209.

Wójcicki, T. R., White, S. M., & McAuley, E. (2009). Assessing outcome expectations in older adults: The multidimensional outcome expectations for exercise scale. *The Journals of Gerontology Series B: Psychological Sciences and Social Sciences*, *64*(1), 33–40.