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ORIGINAL RESEARCH

IMPLEMENTATION OF A COMMUNITY WALKING PROGRAM (WALK ON!) FOR FUNCTIONALLY-LIMITED OLDER ADULTS

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Abstract: *Background:* Walking interventions improve physical function, reduce fall risk, and prevent mobility disability—even in those with compromised walking ability. However, most prior studies have been conducted in controlled research settings, with no dissemination of an evidence-based walking program for older adults who have mobility limitations and/or are socially isolated. *Objectives:* This study reports data on the feasibility and acceptability of a community-based walking program (Walk On!) for older adults who are functionally limited, and assesses changes in physical function among attendees. The program sessions focused on long-distance walking, and took place for one-hour, for two days/week, and for 12 weeks at a time. *Design:* Pilot implementation study. *Setting:* Local church in Winston-Salem, NC. *Participants:* 49 program participants; *Measurements:* Physical function battery and satisfaction survey data, as well as formative evaluation data from six attendees of a focus group, are reported. *Results:* The majority of the participants were >75 years (71%), female (65%), and presented with low levels of physical function (usual gait speed=0.79±0.16; 30.6% used an assistive device). Satisfaction with the program was high (100% would recommend it to others) and focus group results were overwhelmingly positive. Mean attendance to scheduled sessions was 77%±21%, and 63% of participants attended at least 75% of scheduled sessions (n=8 attended 100%). On average, participants improved their 6-min walk distance by 8.9%, their SPPB score by 15.4%, their timed-up-go time by 9.0%, and their usual gait speed by 11.4%. *Conclusion:* The results of the initial evaluation of Walk On! show high feasibility and acceptability of the program, as well as efficacy for improving physical function. Further research is needed to evaluate a delivery method for wider implementation of the program and to definitively test its effectiveness for improving function and other health benefits.

Key words: Implementation, mobility disability, physical activity.

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Introduction

The fastest growing segment of the population are those aged 85+ years and who are at the highest risk for losing mobility, or the ability to ambulate without assistance (1). Difficulties with ambulating independently interfere with quality-of-life, lead to social isolation, increase risk for hospitalization and mortality, and add challenges for caretakers (2-4). Clearly, accessible and effective strategies for maintaining mobility among the growing number of older adults at high risk for mobility disability are urgently needed.

Balance or gait problems, fear of falling, and reduced stamina cause many older adults to be caught in a spiral of compromised mobility, leading to less movement which, in turn, leads to an accelerated rate of functional decline. Ultimately, this could lead to social isolation and the loss of independence. Disruption of this cycle requires a concerted effort to practice ambulating (walking) in a safe environment, where fear of falling is minimized, and with a focus on progression of stamina to enhance or maintain mobility. Clinical trials in controlled research settings show that walking-based interventions improve function of older adults—even in those with compromised abilities (e.g., poor balance, using assistive walking devices, slow, stooped or shuffled gait). Notably, the Lifestyle Interventions and Independence for Elders (LIFE) study in 1635 older adults with physical limitations showed that a walking-based intervention reduced the onset of major mobility disability, and there was evidence that the most functionally limited at baseline derived the most benefit (5). However, the mobility and other functional gains were not sustained following cessation of the intervention (6), emphasizing the need to develop novel strategies or services to provide continuous walking opportunities for all older adults who are able to ambulate, but especially for those with compromised physical function.

However, in most communities, older adults with limited function have little to no opportunities to engage in safe, ability-appropriate physical activity that incorporates walking. Fitness centers, YMCAs, and malls are not suitable for this population due to barriers such as safety and accessibility concerns, the absence of qualified staff trained to modify/adapt activity levels for those with disabilities, and the lack of a socially stimulating environment of peers with similar abilities. In addition, resources required to sustain medically-supervised

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programs are not readily available. Thus, implementation of a group-based community walking program for at-risk older adults through local organizations that have adequate space (track, gym, large hall, etc.), and training of instructors or volunteers to deliver the program, has the potential to mitigate many of these existing barriers.

We recently developed a group-based, instructor-led, community walking program (Walk On!) designed to improve walking ability, balance, confidence, stamina, and social connectedness in ambulatory older adults who are at risk for loss of mobility. This proof-of-concept paper reports data on the feasibility, acceptability and satisfaction with the Walk On! program, along with quantitative changes in physical function.

Methods

Program Overview and Marketing

The Walk On! program was initiated in January, 2018 at a local church which houses an indoor walking track. The program sessions took place for one-hour, for two days/week, and for 12 weeks at a time as a fee-for-service model. The program was staffed with two instructors with a limit of 24 attendees enrolled at a time. To date, all instructors have been trained research staff with a background in exercise physiology or health promotion and prior experience leading physical activity interventions in older adults. Current program costs equate to about $8 per walking session for new attendees and $5/session for those who are returnees. Clients were made aware of the program through local newspapers and physician referrals. We kept advertising to a minimum during the initial phase of program development in order to work out staffing needs and safe, appropriate progression of walking duration and balance exercises.

The initial response to our advertisements was rapid with 35 inquiries from one notice in the local newspaper. Of these, 16 individuals (46%) registered for the initial program. We are now delivering our 7th program session with four new individuals and 21 returning individuals. Five of the initial 16 attendees have been continuously enrolled. Only two individuals were not able to complete the program after signing up due to health problems not related to the program. This paper reports findings from the program's physical function battery and satisfaction surveys from 49 unique program attendees, as well as qualitative data from six of the initial attendees who provided written informed consent to participate in a focus group.

Participants

Individuals who call to express interest in Walk On! undergo a brief phone interview. Interviews are conducted for safety reasons so that leaders have a better idea of each participants' general health, walking ability, cognitive ability and mode of transportation. An intake form was developed to assess these factors, as well as basic demographic, medical history, and medication information. The only criteria for participation are that clients must: 1) be free of current fractures, 2) have the ability to ambulate (not in a wheel chair), 3) understand and be able to follow directions in English (or have a caregiver attend with them) and, 4) provide their own transportation (either through independent driving, caregiver, public transport or other). This research was reviewed and considered exempt by the WFSM Institutional Review Board; however, the six participants who agreed to take part in the focus group provided written informed consent to participate (IRB00049019).

Walk On! Program Conduct:

On the first day, participants complete a liability waiver and goal setting form. They also perform the functional assessments (see below) for the purpose of setting individual activity prescriptions. Instructors use this information to set future daily lap goals for each participant, which are increased by 10% weekly when appropriate. The second session involves instruction about proper walking technique and mechanics. Participants are also taught how to use the lap counter used to count their laps. Future sessions begin with two laps of walking at a slower than normal pace to serve as a warm-up. One day of each week is geared toward improving walking stamina and endurance whereby participants are challenged to keep moving and increase their walking duration. The other day of the week is geared towards improving walking confidence and incorporates at least two laps of "dynamic walking movements", such as backwards/sideways walking, high-knee and posterior-kick walking, and volitional stepping onto targets in various directions. These serve the purpose of stimulating new proprioception patterns and muscle groups that are used for over ground walking and to help with reacting to a "slip" or "trip" that might trigger a fall.

Based on our prior work showing the functional benefits of supplementing walking with tasks designed to improve balance (7), Walk On! participants are encouraged to perform balance/strength "challenges" that are set up nearby. These challenges include: chair rises, holding tandem and semi-tandem stances on hard ground and on a foam pad, toe taps on various size cones, stepping over flexible hurdles, walking on foam balance beam, stepping in/out of plastic ladder, and cross and dot foot slides. Each session ends with group stretching exercises during which program instructors foster interaction among participants by asking questions and providing time for conversation. Participants complete a "tracking sheet" at the end of each session to track progress and facilitate accountability.

Throughout the program, participants are reminded of the importance of focusing on their individual goals and abilities. They are asked to follow their progression as tailored to them and competition is discouraged. Participants are gently urged by program leaders to push themselves to walk more, or to rest (either standing or sitting for a period) when needed. Instructors are trained to be aware of signs and signals of distress (extreme shortness of breath, excess fatigue, abnormal sweating, etc.)

that are signs that a participant should be urged to rest. The goal is for the participant to feel safe and confident in their walking ability. If they use a walking assistive device (or "balance tool"), we encourage them to keep using it. If they would benefit from using a balance tool to allow them to reduce their fear of falling and walk with greater confidence for a longer period of time or distance, we ask them to use such a tool during the program and supply them with a walking stick, cane or walker.

Physical Function Measures

As part of the program curriculum, the evaluation of key measures of function, including 6-minute walk distance, Timed Up and Go (TUG), and the Short Physical Performance Battery (SPPB), including usual gait speed, is performed at the beginning and end of each 12-week Walk On! program. Participants receive a results packet, which also includes a measure of total number of miles walked during the program, to show progress and foster self-efficacy. The 6-minute walk test is reported as the distance walked during a 6-minute period, which for some individuals included a standing rest (8). The SPPB (9) consists of a standing balance test, usual gait speed over a 4-meter course, and time to complete five repeated chair rises without us of arms. Results from the three tests are scored from 0 (inability to perform the task) to 4 and summed for a total score of 0 to 12. The Timed Up and Go (TUG), a measure of mobility and agility (10), evaluates how long it takes to stand up from a chair, walk three meters, turn around a cone, walk back and sit in the chair.

Satisfaction measures

As part of the curriculum, each attendee completes a survey at the end of each program that asks about program satisfaction. This includes location, day and time, length of program, changes in walking abilities, and an opportunity for open-ended responses to both positive and negative aspects of the program and suggestions for improvement.

Focus group

A subset of participants in the initial session of Walk On! agreed to participate in a one-hour research focus group designed to gather participant-level data on program satisfaction and any barriers to participation. The focus group was led by two trained facilitators and was audio-recorded. A scribe was assigned to take notes. The list of IRB-approved focus group questions is shown in Table 3.

Data Analyses

Descriptive statistics were used to summarize the characteristics of the 49 unique individuals who attended at least one Walk On! program in the past year. Changes in the measures of physical function before and after their participation were analyzed using paired t-tests. Frequencies of satisfaction responses were summarized as a percentage. Focus group responses are reported, but not tallied or analyzed.

Results

Participant characteristics and attendance/safety

The characteristics of program attendees are shown in Table 1. Most participants (71%) were >75 years; 2/3rd were female, 22.5% did not drive, six (12.2%) were accompanied by a caregiver, and 36.7% reported living alone. All were ambulatory with no contraindications for walking, but 30.6% used a cane or walker. The majority have compromised physical function as evidenced by a slow usual gait speed and low SPPB score. Mean attendance was 77%±21%, and 63% of the participants attended at least 75% of scheduled sessions (n=8 attended 100%). There were no serious adverse events during the program, but there was one non-injurious fall.

Table 1
Participant baseline characteristics (n=49)

	Mean±SD	Range
Age (yrs)	77.7±6.2	65-92
Gender (% male)	34.7%	--
Use of cane/walker	30.6%	--
Live alone	36.7%	--
6-min walk distance (feet)	1088±339	300-1623
SPPB score (0-12 range)	7.5±2.5	2-12
Chair rise time (secs)*	14.4±3.1	9.0-22.0
4-m usual gait speed (m/sec)	0.79±0.16	1.05-0.53
TUG score (secs)	14.1±4.5	8.4-28.8

*N=12 could not complete this test due to inability to rise from chair without using arms or assistance; SPPB=Short Physical Performance Battery; TUG=Timed-Up-Go

Changes in Physical Function

Mean changes in the physical function measures (except chair rise time) are shown in Figure 1. Overall, there were significant improvements in each of the measures—participants increased their 6-min walk distance by 99±122 feet (8.9%), improved their SPPB score by 1.2±1.6 units (15.4%), decreased their timed-up-go time by -1.3±2.9 seconds (9.0%), and increased usual gait speed by 0.09±0.15 m/sec (11.4%). Among those individuals who could perform the chair rise test, there was a significant decrease in time to complete five chair rises without arms (before=14.3±2.7 secs; after=13.1±3.0 secs, $P<0.01$).

Satisfaction survey

Results from the satisfaction survey are shown in Table 2. Overall, the survey shows a very high degree of satisfaction with the program. The one person who was not satisfied with the program length wished it had been offered for a longer period. The survey also included an open-ended question:

Figure 1
Changes in physical function measures (Paired t-test analyses: *P<0.05; †P<0.01)

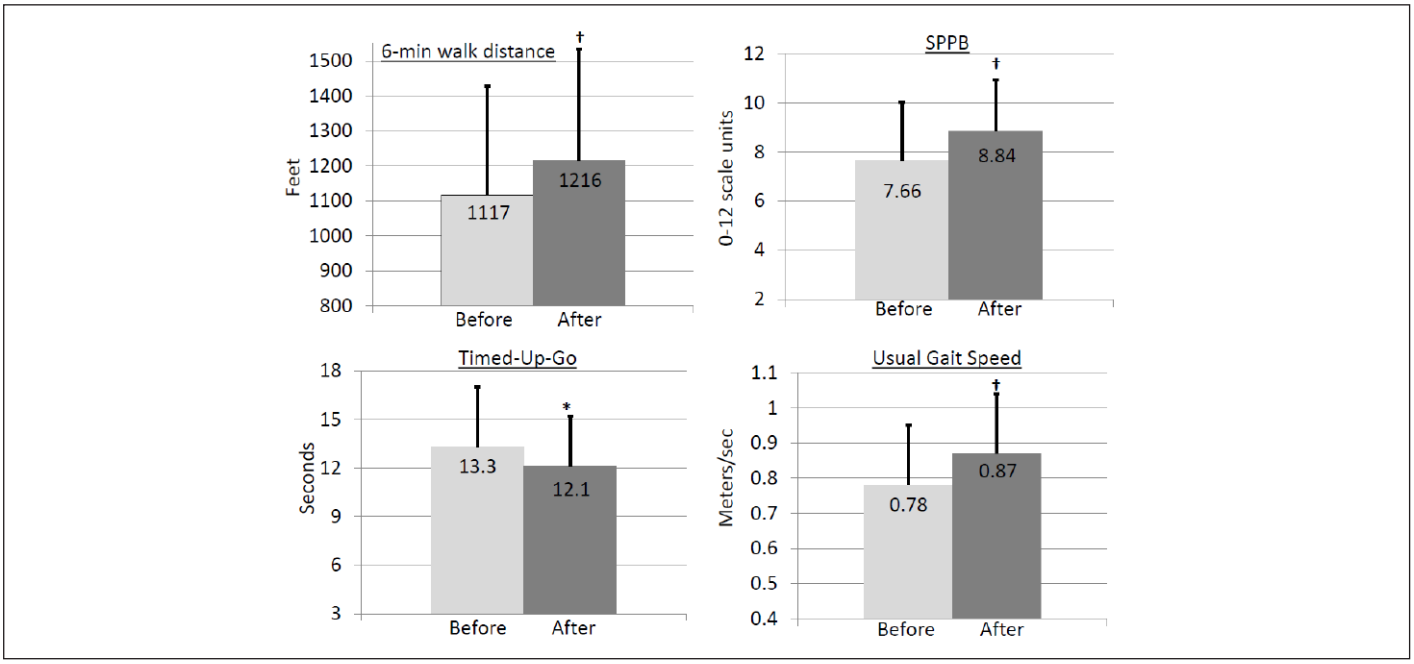

Table 2
Satisfaction survey results (N=39)

Question	Very Much	So-So	Not At All
How satisfied are you with the Walk On! program?	100% (39/39)		
How satisfied are you with the location?	97.4% (38/39)	2.6% (1/39)	
How satisfied are you with the length?	82.1% (32/39)	15.4% (6/39)	2.6% (1/39)
How pleased are you with any changes in your walking abilities?	82.1% (32/39)	17.9% (7/39)	
Would you recommend Walk On! to others?	100% (39/39)		

How has Walk On! affected your walking ability and/or your overall well-being? Please list both positive and negative things. A strong majority of responses were positive and included these comments: "Very pleased with the instruction and environment"; "Encouraged me to walk at home and neighborhood"; "Love the stretching and the different stations"; "Stamina, speed, distance, balance have all improved"; "Helped my recovery from fractured pelvis"; and "I now walk with more confidence". The only negative aspects reported were: "My problem is my back, but nothing seems to help this"; "Aggravated groin pain a little"; "Cost was difficult"; "Most Thursdays were too strenuous for me--ended up with cramps in legs at night"; and "I just am having trouble with my deep water aerobics being on same day".

Focus Group Results

Responses to the focus group questions were collated and are listed in Table 3. Overall, responses were positive with some suggestions for improving the program. With regard to reasons why participants chose to sign up for Walk On! they reported: 1) "because I knew I would benefit"; 2) "wanted to get back to walking but didn't feel safe to walk on own"; 3) "wanted to be held accountable and have a group to walk with"; and 4) "hoping to improve my balance and walking stamina". With regard to satisfaction with the program, participants reported: 1) "the timing and costs are appropriate", 2) "I feel more confident in my balance and walking abilities"; 3) "it is easier to walk longer and farther"; 4) "am pleased that the program was individualized to my pace"; and 5) "would recommend the program to others".

Discussion

The results of the initial evaluation of Walk On! show good feasibility and high acceptability among participants. Clients voiced strong satisfaction with the program frequency, length, location/environment, activities and progression, instructors, and with their enhanced walking and balance

Table 3
Focus group responses (N=6)

Focus Group Question	Participant Responses
How did you hear about the Walk On! program?	• Winston-Salem Journal
	• Sticht Center on Aging VITAL newsletter
What made you decide to participate in Walk On!?	• Had been wanting to walk, but didn't feel safe to walk in neighborhood (dogs, etc.)
	• Sounded like just the thing needed for inspiration to get started with stamina and balance
	• Liked it was indoors, out of the weather
	• Series of health complications had been keeping me from exercise; Timing perfect
	• Concerned about falling
	• Wanted accountability with scheduled specific days/times to walk to keep me on track
Did the Walk On! program have any positive impact on your life? If so, how?	• More confident in walking
	• Gave me a place where I feel safe to walk
	Knowledgeable about space to use that is safe
	• Can walk further than I thought I could--little disappointed it wasn't more of an improvement
	• Added confidence for my children; They don't fear me walking, just knowing I was in this program
Did your walking and balance improve?	• Getting up and getting down from chair is easier
	• Learned my balance is worse than I thought
	• Didn't do the exercises on my own--try to do things without touching or holding on
	• Alerted me I needed to practice and improve my balance; Inspired me to do something
Did the Walk On! program have any negative impact on your life? If so, how?	• Gained weight; Every time leave program we go out to eat
Were you sore after attending?	• No
	• Only the first time it was just a walking day. Really pushed after that day and had cramps along shin for 10-15 mins that night; Did stretches to help
	• Exercises didn't go far enough; No pain no gain. Thought you had to feel it in order to know you were doing something. Glad not to hurt real bad after not doing anything
Did the program take too much time away from other activities?	• No
	• No, was glad not to be doing chores
	• Better than "other" activities
Would you recommend the Walk On! program to other people? If so, why?	• Very definitely for all the positive things we have said—Confidence, balance, stamina
	• I would and have
	• Cost could be hindering, but is an incentive for me. If I pay money, I'm going to show up
	• Considered asking friends to come observe but didn't want to be a nag
	• Nice to see other people my age or older, felt much more comfortable seeing people with other abilities
Describe your favorite aspect of the Walk On! program	• Finding out I could do things I didn't think I could do
	• The stations; Helped me to see where I was challenged; Appreciated I was offered suggestions on how to do things differently without a sense of "you're doing it wrong"
	• Working with competent people who made good suggestions; Level of expertise was very reassuring to me. Tips or suggestions were appropriate for me and the activity
	• How it is to be 75? I hope it's like yesterday/tomorrow. "I can do that." Slow penetrating things that made you realize what you can do
Describe your least favorite aspect of the Walk On! program.	• I didn't always enjoy the balance stations. More focused on walking and building stamina. My problems with balance are tied to arthritis flare-ups in my feet. Some of the balance activities didn't seem challenging enough
Describe your level of motivation to participate in the Walk On! Program.	• High at the start (85%)
	• Delighted to hear about the program and anxious to start
	• 100%
Did other participants in the program affect your motivation?	• No
	• Yes there were people who were able to do fewer laps than me, but they kept coming and doing their laps--very inspiring

Table 3 (continued)
Focus group responses (N=6)

Focus Group Question	Participant Responses
Describe any changes you would make in the Walk On! program	• Add music
	• Significance of ankles--add in more ankle exercises/training
	• More balance exercises
	• Day we talked about posture, breathing, etc. was excellent-Repeat that about week 6
	• Longer week duration-Especially during colder weather when we are less likely to do anything
	• Is it reasonable to do outdoor work-subdividing the group? Stepping off curves, walking on ground/sidewalk?
Did the cost of the Walk On! program influence your decision to participate?	• No
	• Not really--wanted to be sure didn't throw it away by not coming
	Certainly not for what we received in terms of individualized program, and in terms of attention to each of us. Feel like I got plenty for my money
Is there anything else anyone would like the organizers of the program to know?	• How soon can we get it going again?

abilities. This paper reports data from 49 unique participants who enrolled in Walk On!, but several of them registered for multiple sessions, illustrating the high degree of interest in the program. In addition, clients attended more than three-quarters of their scheduled walking sessions. All measures of physical function improved by 9-15% after participation in 12 weeks of the program, and the increases in gait speed and six-minute walk time can be considered small clinically meaningful improvements while the change in SPPB is a substantial clinically meaningful improvement (11). However, a randomized, controlled study is needed to fully test the effectiveness of Walk On! for improving function and other health benefits.

Of note, although there was a wide range of ages, walking abilities, and functional status among attendees, many would be characterized as mobility limited or at high risk for mobility disability. For example, a usual gait speed of 0.8 m/sec is suggested as a minimum for safe community ambulation (12) and is the cut-point advised by European Working Group on Sarcopenia in Older People as an indicator of severe sarcopenia (13). Approximately 54% of the Walk On! attendees walked slower than 0.8 m/sec at baseline, and 89% walked slower than 1 m/sec. Importantly, the ability to walk 1/4 mile (or 2-3 city blocks) is vital to the independence of community-dwelling older adults and the inability to walk 1/4 mile in 15 minutes has been used as an indicator of mobility disability (14). Based on the 6-min walk times of our sample, we estimate that 21% would meet this definition of mobility disability, even with the use of an assistive walking device. In addition, a TUG time of less than 12 seconds strongly discriminates between community-dwelling and institutionalized older women and has been suggested as a cut-point for normal mobility (15); only 35% of our sample performed the TUG under 12 seconds. Also 49% scored ≤8 on the SPPB, which is considered indicative of poor lower-extremity functioning. Notably, this subset of extremely low functioning older adults are often not included in physical activity research, nor are there enough community-based physical activity settings or programs accessible to them.

Addressing the problem of mobility loss, and the social isolation and fear of falling that accompanies it, in older adults with limited mobility or compromised function is an important public health challenge. The Phase 3 LIFE study demonstrated the benefits of a walking-based intervention on prevention of mobility disability (5). In addition, group-based physical activity programs have known advantages over performing structured activity alone for enhancing social connectedness and compliance/uptake (16). However, in most communities, there are no group-based walking programs in close proximity to, and in safe environments for, older adults who have mobility limitations. Walk On! was designed to provide a group setting opportunity for this population to engage in safe, ability-appropriate, walking-based movement that is focused on enhancing mobility. This proof-of-concept paper shows the rapid uptake of the program among older adults in our community with strongly favorable responses from those who participated. Based on these early positive data, we Walk On! as one means of meeting the strong need for increasing this population's access to safe, social, accessible and effective walking opportunities.

A large body of prior research shows the value of interventions that promote walking for improving a myriad of health outcomes in older adults. However, most of these studies were either conducted in more functional older adults in a medical/academic research setting, or were not supervised, nor group-based, and were focused on promoting walking in an individual's home environment (17-21). Despite the clear benefits of continued walking activity in this at-risk population, none of the currently available evidence-based physical activity programs for older adults put a clear emphasis on ambulation over a longer distance in a group and supervised setting. Not only does Walk On! emphasize primarily long-distance walking in a setting of peer support and accountability, but other unique

aspects include: 1) objective assessment of changes in physical function to provide motivation and feedback; 2) instruction and emphasis on proper walking technique; 3) inclusion of backward and lateral walking, as well as step training, which have all been shown to enhance reaction time, gait, and balance performance (22); 4) inclusion of balance exercises which also augment walking-related changes in function (7); 5) setting objective and ability-appropriate goals for progression; and 6) emphasis on the real possibility that setbacks due to physical/medical issues are expected and normal, while teaching strategies for persisting with goals.

Since this was a proof-of-concept evaluation of the initial conduct of the Walk On! program, this study has several limitations that need to be considered when interpreting the data. First, the lack of a control group and a randomized design prevent inference that the functional improvements were caused by the program. Next, the fee-for-service nature and limited marketing of the program limits the generalizability of the enrolled sample. Finally, the outcomes are limited to short-term (e.g., 12 weeks) changes in physical performance measures, and more patient-centered and long-term health outcomes of stronger relevance to this population of older adults need to be evaluated in future research.

The ultimate objective of this research is to establish a model group-based walking program that is scalable and can ultimately be adapted for use in a variety of community settings accessible to vulnerable older adults to perform safe and effective walking and form social connections to promote quality-of-life and mobility. With dissemination and implementation in mind, future research needs to inform scalability, including the economic costs of delivery, and establish relevant barriers, supports, and infrastructure necessary to implement such a program.

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