

Introduction

- In prospective studies, greater physical activity (PA) has been shown to predict better cognitive performance and a decreased risk of dementia (OR=0.55-0.72).^{1,2}
- Experimental studies show that increasing PA improves cognitive performance in cognitively normal adults.³
- Given these findings and the absence of a cure for Alzheimer’s disease (AD), it is important to further our understanding of how PA might be used to prevent or delay AD.
- In the Physical Activity and Alzheimer’s Disease 2 study (PAAD-2; NIH R01AG058919), we examined the effects of a 1-year exercise intervention on cognition, brain health, and blood-based biomarkers in cognitively unimpaired (MoCA ≥ 23)|(MoCA=23|24 + MIS ≥11), community-dwelling middle-aged (40-65 years) adults with a family history of AD (FH+).⁴
- Here, we report on recruitment strategies and efficacy and on adherence to the one-year exercise program.

Methods

- Cognitively unimpaired (MoCA=27.92±1.69) adults (N=180, Age=56.4±6.42 years) who had a FH+ and did not meet current PA guidelines (i.e., <90 min moderate/vigorous PA/week) were randomized to an exercise intervention (group strength training + moderate-intensity walking 3x/week) or usual care control group.
- Effectiveness and costs of recruitment was tracked across seven distinct categories: *Social Media, Search Engines, Traditional Media, Word of Mouth, Email Campaigns, Printed Materials, and Community Events*,.
- Exercise adherence was assessed in the 98 participants assigned to the exercise condition. Group exercise sessions were face-to-face from August 2019 to March 2020 and then pivoted to a fully virtual format in response to COVID-19 pandemic restrictions.
- Attendance at strength training sessions was reported by the group exercise leader and performance of walking was tracked weekly via self-report in REDCap.
- Retention (percent remaining active), dropout rate (percent not completing post-test), and adherence (percent sessions attended by those who completed post-test) of the exercise group are presented.

Results

Category	Total Recruited	Total Enrolled	% of Recruited who Enrolled	Details	Total Recruited	Total Enrolled
Social Media	238	67	28.15%	Facebook Advertisement	221	63
				Facebook Group/Post	6	1
				NextDoor	7	2
				Instagram	4	1
Search Engines	59	18	30.51%	Alzheimer's Association Trial Match	1	1
				Alzheimer's Prevention Registry	32	10
				Internet Search/Google	17	4
				Clinicaltrials.gov	9	3
Traditional Media	58	16	27.59%	Radio Advertisement	30	9
				News Broadcast	15	6
				Newspaper Advertisement	6	1
				UNCG Magazine Spring 2023	7	0
Word of Mouth	46	16	34.78%		46	16
Email Campaigns	7	4	57.14%	UNCG Campus Weekly	3	3
				Jewish Federation Cooking Class	1	1
				Abbotswood Community	2	0
				UNCG HHS Alumni	1	0
Printed Materials	17	2	11.76%	Flyers: PTRC AAA, PACE of the Triad	17	2
				Billboard	0	0
				Car magnet	0	0
Community Events	44	1	2.27%	Grasshopper's Baseball Game	19	1
				UNCG Faculty/Staff Welcome Back	9	0
				Folk Festival	4	0
				UNCG Science Everywhere	4	0
				Elder Abuse Awareness Walk	3	0
				Well-Spring Community Health Fair	3	0
				Lexington Health Equity Conference	1	0
Unknown	314	56	17.83%	Walk to End Alzheimer's	1	0
OVERALL	783	180	22.99%		314	56

Table 1. Recruitment methods, total recruited for initial phone call, total enrolled, and percent of recruited who enrolled in the study.

Recruitment (see Table 1)

Effectiveness: Social Media—driven primarily by paid Facebook advertisements—was the most successful strategy, yielding 238 inquiries and 67 enrolled participants (see Table 1).

- Internal Yield: 28% of all Social Media recruits ultimately enrolled in the trial
- Total Impact: 37% of total study enrollment (N=180)

Cost-Efficiency: The average cost across all methods was \$163 per enrolled participant.

- Search Engines (\$16/enrolled participant) and Social Media (\$90/enrolled participant) were the most cost-effective paid methods.
- No-cost options, including Email Campaigns and Word of Mouth, resulted in 20 enrolled participants.

Adherence (see Table 2)

	Intervention Format	Dropouts	Retention	Adherence
Cohort 1	started face-to-face → shifted to virtual after 8 mo.	low (0%)	moderate (66%)	low (61%)
Cohort 2	expected face-to-face → received virtual	high (57%)	low (28%)	low (58%)
Cohort 3-11	expected virtual → received virtual	low (13%)	high (73%)	high (74%)

Cohort	Exercise Start Date	Assigned to Exercise Intervention	Dropouts	Remained Active Entire Intervention	Average Adherence for those who Attended Post-test (includes those who never started exercising or stopped exercising before post-test)	Average Adherence for those who Remained Active Entire Intervention
1	08/2019	9	0	6	61.22%	75.28%
2	06/2020	7	4	2	56.97%	86.72%
3	11/2020	13	0	12	84.14%	87.70%
4	03/2021	9	0	8	77.52%	84.52%
5	08/2021	9	2	6	74.01%	86.34%
6	11/2021	9	3	5	68.94%	82.39%
7	04/2022	9	2	7	88.29%	88.29%
8	08/2022	7	1	6	80.10%	80.10%
9	12/2022	8	0	6	61.97%	78.84%
10	05/2023	5	2	2	65.33%	90.64%
11	10/2023	13	1	8	58.83%	83.14%

Table 2. Descriptive information for cohorts including start date, number of exercisers, and session adherence calculated as number of sessions attended divided by total sessions possible.

References

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NOTE: MoCA = Montreal Cognitive Assessment; MIS = Memory Index Score of MoCA

Discussion / Conclusion

- Darko et al. reported that across 96 studies, Facebook was effective for recruiting participants for research studies.⁴ Our findings are consistent with this but add to the literature because Darko et al.’s findings reflect that most studies target general adults ≥ 18 years (n=28), specific minimum ages (n=4, ≥30, 35, 45, or 60), young adults (n=6; 18-45 yrs), or broad age ranges (n=4, 18-69). No studies in their review explicitly evaluated middle-aged adults (40-65 yrs).
- Participants recruited specifically for a virtual exercise intervention after the onset of the COVID-19 pandemic demonstrated high retention and adherence. This finding is encouraging given that these participants initiated the intervention in November 2020, when the impacts of COVID-19 were lingering, and continued in the years following the pandemic. Virtual sessions are an accessible and effective delivery model for exercise interventions in middle-aged adults.
- Future physical activity intervention studies may use this information to support methodological, budgeting, and time considerations for recruitment and expectations for adherence to virtual exercise sessions.