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Impacts of Geri-Fit® on Health Outcomes in Older Adults

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Abstract

Background/Objectives: The Geri-Fit® program, recognized by the National Council on Aging, is known to improve strength in older adults, yet it lacks robust evidence on clinical outcomes. The current study was performed to assess the change in clinical outcomes in addition to patient-reported change in mobility and general well-being **Methods**: A total of 227 adults aged 60 and older were recruited from clinics and community sites across Galveston and Harris counties and participated in 45-minute classes twice weekly for 12 weeks, led by trained Geri-Fit® instructors. A mixed-methods approach includes pre- and post-collection of biometric measures of Hemoglobin A1c, total cholesterol, weight, and waist circumference. Participants also completed mid- and post-program surveys reporting changes in health behaviors, psychosocial outcomes, and physical changes, and provided qualitative feedback. **Results**: showed that 44% of participants lost weight, nearly half reduced their waist circumference, 43.5% improved their Hemoglobin A1c, and total cholesterol decreased significantly (from 167.77 to 155.04 mg/dL; p=0.02). Self-reported outcomes indicated that almost 100% of participants showed improvement or maintenance in mobility, strength, physical activity, and well-being. **Conclusions**: These findings suggest that Geri-Fit® is associated with favorable clinical outcomes and improved functional health, supporting its potential as a community-based intervention to enhance physical activity, improve self-management, or reduce the risk of chronic disease among older adults.

Keywords: aging; cholesterol; Geri-Fit®; Hemoglobin A1c; older adults; progressive resistance training

1. Introduction

The US population is rapidly aging, with older adults (aged 65+) increasing from 4.7% to 16.8% in the last two decades and projected to exceed 20.9% by 2050 [1,2]. This demographic shift is associated with higher healthcare utilization, as older adults accounted for 40% of healthcare spending in 2023 [3,4]. With the median age of Americans rising from 30 years in 1980 to 39 years in 2022, the number of chronic conditions has increased [5]. Over 90% of older adults had at least 1 or

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more chronic conditions, with 78.8% reporting multiple chronic conditions such as high blood pressure, high cholesterol, and arthritis [6].

Chronic conditions can compound with the natural processes of aging and affect older adults' ability to manage their health. As adults age, muscle power and performance decline rapidly after age 65 for women and 70 for men [7]. When functional capabilities and physical performance are compromised, balance and fall-related issues can occur. Each year, approximately $50 billion is spent on medical costs associated with non-fatal fall injuries, including hospital or nursing home care, rehabilitation, use of medical equipment, and other professional services [8]. These costs do not include the long-term effects of falls or mobility-related injuries, including disability, lost time from other duties, and reduced quality of life [8]. Regular physical activity can help maintain physical functioning and reduce the risk of balance and fall-related injuries.

As of 2022, only 13.9% of older adults met federal physical activity guidelines for leisure-time aerobic and muscle-strengthening activities, which recommend 150 minutes of moderate-intensity physical activity and at least 2 days of muscle-strengthening activity every week [9]. The decline in strength with age can be slowed by regular participation in exercise to increase muscle strength [7,10]. Additionally, physical activity is closely associated with lowering the risk of developing or worsening chronic diseases such as heart disease, stroke, diabetes, or osteoporosis [9]. While many senior fitness programs focus on aerobic activity through walking or dance-style classes, strength training or resistance training is effective at slowing the muscle atrophy associated with aging [10].

One program that implements progressive resistance strength training for older adults is Geri-Fit®. It is a tier III evidence-based health promotion and chronic disease self-management support program recognized by the Administration on Aging (AoA) and the Administration for Community Living (ACL), a division of the U.S. Department of Health and Human Services (HHS) [11]. It is frequently recommended nationally as a resource for physical activity and fall prevention in older adults [12–14]. Geri-Fit® is designed for older adults using functional strength-training workouts to rebuild and maintain strength. It uses a combination of strengthening exercises, stretching and range-of-motion exercises, stability and balance training, gait exercises, and cardiovascular activity.

The Geri-Fit® program was integrated into The University of Texas Medical Branch (UTMB)'s suite of Patient Education Programs and expanded to community settings, including public libraries and faith-based organizations. The study findings may provide insights into creating evidence of the multidimensional benefits of physical activity for older adults through an academic-community partnership. While this program is considered a standard by the National Council on Aging (NCOA), the evidence supporting its effectiveness is limited, and its impact on clinical health outcomes has not been thoroughly investigated. The purpose of this study is to examine UTMB's experience in the field of implementation science related to participant enrollment, retention, and centeredness and evaluate the impacts of Geri-Fit® on health outcomes (e.g., glycemic and cholesterol levels.

2. Materials and Methods

2.1. Data Source

A total of 227 participants aged 60 and older were recruited from UTMB clinics, senior centers, community-based organizations, and libraries where classes were held. Classes were delivered at various locations around the Gulf Coast, from Galveston Island up to Seabrook, spanning both Galveston and Harris counties. Classes were led by senior center employees, and UTMB employees trained and certified as Geri-Fit® coaches. Participants underwent Geri-Fit® for 45 minutes bi-weekly for 12 weeks. Participants used a sturdy chair, a resistance band, a light set of dumbbells, and water during the classes. The Geri-Fit® classes consist of a warm-up, a stretch, and a series of strength-training, range-of-motion, stability and balance, and gait exercises for the back and shoulders, legs, chest, arms, and abdominals, followed by a cool-down stretch.

2.2. Measurements

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Participants were surveyed at several points throughout the program using a mixed-methods approach. Point-of-care Hemoglobin A1C (A1C), total cholesterol (TC), weight, and waist circumference (WC) were measured at baseline and after program completion. Halfway through the program and after program completion, participants took a Geri-Fit®-specific survey, reporting changes in mobility, overall health, overall strength, balance, standing or walking unassisted, energy levels, physical activity levels, and general well-being. Participants also provided qualitative feedback through open-ended questions about their experience with the program (Appendix A-Table A1). Participant surveys were collected via the Research Electronic Data Capture (REDCap®) tool hosted at the University of Texas Medical Branch [15,16].

2.3. Quantitative Data Analysis

Descriptive statistics were computed to summarize individual characteristics, using means and standard deviations for continuous variables and frequencies (percentages) for categorical variables. Bivariate analyses using chi-square tests were conducted to examine changes in biometric measures (e.g., weight) and self-reported health outcomes (e.g., improved balance) at mid- and end-of-program, respectively. All analyses were conducted using STATA v18, and any p-value less than 0.05 was considered statistically significant.

2.4. Analysis of Open-Ended Questions

Participants' responses to the open-ended questions were organized and classified using Microsoft Excel. Data were also reviewed by AM and W-CL, and any disagreements between the two authors were discussed and resolved by a team meeting. Themes emerged if certain topics came up repeatedly. The frequency for each theme was then reported to reflect patterns of their satisfaction and suggestions for our program.

3. Results

Seventy-five participants completed the surveys (reported outcomes). Participants underwent assessments of weight, WC, A1C, and TC (measured outcomes). Participant characteristics are summarized in Table 1. The majority of participants were females, and the most common chronic condition was arthritis.

Table 1. Individual Characteristics of Geri-Fit® Survey Participants (n=75).

Characteristics	N (%) or Mean (Std.)
Gender	
Male	7 (9.3%)
Female	68 (90.7%)
Age (Range 60-89)	75.3 (0.74)
Health Conditions	
Hip or Knee Replacement	8 (10.7%)
Use a Cane, Walker, or Wheelchair	13 (20.0%)
Have Heart Diseases	16 (21.3%)
Have Diabetes	24 (32.0%)
Have Arthritis	50 (55.7%)

Table 2 provides measured changes in health outcomes, including weight loss, waist circumference, A1C, and cholesterol levels. Of the 75 participants who completed surveys, these variables were collected from those who completed the lab work as baseline and after the program, with some participants missing lab appointments or declining to measure lab values such as A1C or TC. We observed that over 40% of participants decreased their A1C by an average of 0.9%, and 60% reduced their total cholesterol (TC) by an average of 7% (p=0.02).

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Table 2. Measured Changes in Health Outcomes Before and After Geri-Fit®.

Health Outcomes	Baseline	Post-Class	Change	Improved n/ Total N (% people)	p-value
Weight (lbs) (n=75)	177.14 (4.90)	176.18 (4.53)	-0.95 (1.44)	33/75 (44%)	0.8870
Waist Circumference (WC) (inches) (n=23)	37.9 (1.21)	38.2 (1.26)	0.31 (0.53)	10/23 (44%)	0.5582
Hemoglobin A1c (A1C) (%) (n=47)	6.33 (0.14)	6.24 (0.13)	-0.089 (0.10)	23/47 (49%)	0.3691
Total Cholesterol (TC) (mg/dL) (n=25)	167.77 (7.22)	155.04 (6.49)	-11.72 (4.70)	15/25 (60%)	**0.0200**

Table 3 demonstrates the reported changes in participants' physical strength and abilities. After program completion, all participants indicated improvement or no change in their strength, walking ability, physical activity, and driving skills. In addition, fewer people were afraid of falling, and more people reported improved well-being.

Table 3. Changes in Physical Strength and Abilities. The number (N) and percentage (%) of people who reported "Improved" or "About the Same" in the survey.

	Mid-Point of Class N (%)	At Class Completion N (%)	p-value
1. Geri-Fit® Lifted Your Spirit or Put You in a Better Mood	71 (94.7%)	69 (92.0%)	0.513
2. Lost Weight	29 (38.7%)	29 (38.7%)	1.000
3. Better at Raising Arms Overhead	64 (85.3%)	65 (85.7%)	0.814
4. Mobility	74 (98.7%)	75 (100.0%)	1.000
5. Overall Health	72 (96.0%)	74 (98.7%)	0.620
6. Overall Strength	74 (98.7%)	75 (100.0%)	1.000
7. Balance	71 (94.7%)	74 (98.7%)	0.367
8. Stand Up without Assistance	74 (98.7%)	74 (98.7%)	1.000
9. Walk without Assistance	73 (97.3%)	75 (100.0%)	0.497
10. Walk Up and Down Stairs	73 (97.3%)	75 (100.0%)	0.497
11. General Well-Being	72 (96.0%)	75 (100.0%)	0.245
12. Energy Level	72 (96.0%)	74 (98.7%)	0.620
13. Level of Physical Activity	72 (96.0%)	75 (100.0%)	0.245
14. Fear of Falling Down	72 (96.0%)	75 (100.0%)	0.245
15. Changes in Pain	72 (96.0%)	73 (97.3%)	1.000
16. Changes in Memory	72 (96.0%)	74 (98.7%)	0.620
17. Driving Skill and Ability to Turn the Head	75 (100.0%)	75 (100.0%)	1.000
18. Hand and Finger Strength	74 (98.7%)	74 (98.7%)	1.000

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Table 4 summarizes participants' reflections on this program. 58.67% (44/75) of participants reported improvements in their physical function, including walking, standing, flexibility, and endurance. 32% (24/75) indicated improvements in their mental, behavioral, or social well-being, including feeling motivated and having fun. Three participants reported improvements in both domains. 40% of participants highlighted the program's positive aspects, including great instruction and thoughtful coaches. Six participants offered suggestions for improvement, with mixed feedback; some preferred a longer program, while one suggested a shorter duration.

Table 4. Feedback from Participants. The number (N) of participants indicating improvements responding to open-ended questions.

Subjects	N	Selected Quotes
Physical Improvement	44	I am able to step up and down a curb or stop without holding onto a railing or other support. I was not able to do this prior to Geri Fit. (ID-42) Stretch arms behind back easily now/Shoulders more flexible (ID-63) Geri-Fit® has helped me maintain another activity (ID-75)
Mental, Behavioral, or Social Improvement	24	Geri-Fit® has helped me continue walking miles a day. (ID-6) Exercise programs keep you to a schedule and keep you going. (ID-10) Have fun with other members like family. (ID-52)
Both Physical and Mental Improvements	3	Physically I feel better and have a more positive attitude towards aging. (ID-40) Better balance and a feeling of more confidence since I feel stronger (ID-41) Can use a public bathroom again without a handrail, improve self-confidence, assertiveness, speak up for myself when I need to, make friends easier. (ID-57)
Other Positive Aspects of Geri-Fit®	30	The coach did an awesome job of changing things and increasing reps as we went along. (ID-12) My coach is outstanding! She is so thorough, patient, & kind. She even helps us do the exercises correctly, so we get the most benefit from them. She is superb! Can this class please be offered again next semester? Thank you! (ID-55) Instruction has given me a whole new range of exercises to do at home. (ID-74)
Suggestions	6	Keep it going. (ID-7) Music could be used. (ID-24) Have weekly classes with no breaks. (ID-34) Need more exercise programs at senior center. (ID-51) Hope to do it year around. (ID-61) Would rather have 8 weeks instead of 12 weeks. (ID-68)

4. Discussion

This study examined the implementation and outcomes of the Geri-Fit® program delivered through UTMB's community partnerships across Galveston and Harris counties. It is the first to report statistically significant improvements in clinical outcomes with Geri-Fit®, namely, a 7% reduction in total cholesterol and a non-statistically significant 0.9% improvement in glycemic control, suggesting protective cardiometabolic effects of the program. Nearly all participants reported improvements or maintenance of strength, mobility, balance, and overall well-being, underscoring Geri-Fit®'s meaningful functional and psychosocial benefits for older adults in the community.

4.1. Measured Outcomes

We observed improvements in key measured outcomes, including TC, A1C, and WC, suggesting reduced cardiovascular risk and the potential prevention of further chronic diseases [17]. There was

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a significant 7% reduction in total cholesterol at the completion of Geri-Fit®, consistent with evidence that resistance training decreases total cholesterol in people with and without diabetes [18,19]. Resistance training enhances lipid metabolism by upregulating lipoprotein lipase activity. This increases the clearance of low-density lipoprotein from the blood, while simultaneously increasing muscle mass and resting metabolic rate, thereby facilitating more efficient fat processing [20].

A1C decreased by 0.9% at the completion of Geri-Fit®. Although not statistically significant, such a reduction is clinically significant. Our findings are consistent with other reports indicating that resistance training reduces A1C levels in people with or without diabetes [21–27]. In fact, the reduction we observed was greater than that previously reported in people aged 60 and older with or without diabetes [28,29]. Resistance training increases skeletal muscle mass [21], enhancing glucose uptake via glucose transporter type 4 and improving insulin sensitivity [30,31].

Additionally, nearly half of the participants experienced a reduction in waist circumference, a key marker of improved cardiometabolic risk [32]. Our findings were consistent with previous studies showing that strength training reduces WC by decreasing abdominal adiposity, including visceral fat accumulation around internal organs [33,34].

4.2. Reported Outcomes

The self-reported outcomes demonstrate consistently high rates of perceived improvement or maintenance across multiple domains of health and physical activity. All program completers reported improved or maintained ability to walk without assistance, and to walk up and down stairs, reduced fear of falling, improved driving skills, level of physical activity, mobility, overall strength, and general well-being. Given the preservation and improvement of muscle strength and functional capacity to combat the aging processes, these findings align with the existing literature on the impact of resistance training in older adults [7,35,36]. Maintaining function is particularly important for people with chronic diseases such as arthritis, diabetes, or heart disease, as it allows them to maintain or improve their physical activity capabilities to manage their health.

Importantly, the qualitative findings reinforced quantitative results. Our community-based Geri-Fit® program is aligned with the framework of successful aging, increasing participants' social engagement while cultivating healthy behaviors [37]. Participants described increased confidence, improved independence (e.g., navigating curbs and using public restrooms without assistance), enhanced flexibility, and better endurance. One third of our participants stressed that the program structure enabled them to start exercise routines with feasible, evidence-based movements. Also, attending a group-based program made them have a sense of belonging, which greatly improved their motivation to stay in the program. These psychosocial benefits align with the literature, which finds that physical activity that provides social opportunities can enhance well-being, promote emotional health, and support successful aging [38]. Previous research on community-based programs has found that implementing physical activity or fitness programs in communities increases older adults' psychological functioning and emotional connection with others, thereby improving quality of life [39,40]. These outcomes align with the multidimensional goals of a physical activity-based community program and highlight how the benefits to older adults extend beyond measurable biomarkers.

4.3. Feasibility

A key strength of this study is the real-world implementation of an evidence-based program through an academic medical center integrated with community partnerships. Developing Geri-Fit® in libraries, churches, senior centers, and community organizations increased program accessibility and likely reduced barriers to participation. The UTMB implementation of the Geri-Fit® program is consistent with other community-based exercise programs, demonstrating its accessibility and feasibility [41–43]. Training both UTMB staff and community partners ensures program fidelity while leveraging existing community infrastructure for older adults. The mixed methods design also strengthens the findings of this study. Objective biometric measures were complemented by patient-

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reported outcomes and qualitative feedback to provide a more comprehensive understanding of participants' experiences and impact. Future work will expand on this by interviewing administrators of community-based organizations to better understand how the Geri-Fit® program benefits partner organizations and supports broader community impact.

4.4. Limitations

Limitations include high attrition and incomplete survey/laboratory follow-up. While 227 participants have matriculated through the Geri-Fit® program, only 75 completed the surveys, and fewer than that have completed all laboratory follow-ups. While some of these data limitations can be addressed through improved follow-ups, participants ultimately choose whether to complete surveys or lab work. In addition, the population was predominantly female (90.7%), which may limit the generalizability to older men. Moreover, self-reported measures may be subject to social desirability bias, particularly in this group-based intervention if strong instructor relationships are present. However, while it is acknowledged that some of these variables are self-reported and unverified, this is an intentional part of program design to allow participants to reflect and report their perceptions of the program and changes in their abilities.

5. Conclusions

This work highlights that the Geri-Fit® model of structured resistance and functional strength training was associated with improved total cholesterol, favorable trends in glycemic control, and substantial self-reported gains in physical function, strength, and well-being among older adults. Beyond these outcomes, this program increases community awareness of the importance of regular exercise and strength training as essential components of healthy aging. As a community-based, physical activity intervention, Geri-Fit® serves as a bridge between the health system and community to improve biometric outcomes, functional health, and chronic disease management. Its adaptable design allows Geri-Fit® to align with diverse community cultures and partner effectively with a range of organizations; therefore, promoting accessibility and supporting older adults aging in place. Overall, this implementation study provides applied, real-world evidence that scalable, evidence-based exercise programs can promote functional independence through improved mobility and strength, improve perceived well-being and health, and potentially mitigate chronic disease risk and complications in this population. Further directions include expanding accessibility across geographic regions, strengthening integration with complementary services, such as nutrition education, and exploring sustainable funding pathways, including potential alignment with CMS reimbursement models.

Author Contributions: Conceptualization, H.S. and H.S.S.; methodology, H.S., M.G., and W-C.L.; formal analysis, W-C.L.; investigation, A.M; resources, H.S. and C.C.; data curation, W-C.L., A.M., N.B., and M.G.; writing—original draft preparation, A.M.; writing—review and editing, H.S.S., H.S., W-C. L., N.B., M.G., C.C.; visualization, H.S.; supervision, H.S.; project administration, A.M., and C.C.; funding acquisition, H.S. and H.S.S. All authors have read and agreed to the published version of the manuscript.

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Institutional Review Board Statement: Ethical review and approval were waived for this study it was considered a quality improvement project that does not test a new hypothesis or interfere with usual care. The UTMB IRB considered the study non-regulatory research, not human research, and no IRB approval was required.

Informed Consent Statement: Patient consent was waived per IRB (see above).

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Data Availability Statement: The de-identified data is available upon request.

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Conflicts of Interest: The authors declare no conflicts of interest.

Abbreviations

The following abbreviations are used in this manuscript:

A1C	Hemoglobin A1c
CMS	Centers for Medicare & Medicaid Services
TC	Total cholesterol
UTMB	University of Texas Medical Branch
WC	Waist circumference

Appendix A

Table A1. Geri-Fit®.

Demographic Information	
First Name	
Last Name	
Current Height (in inches)	
Current Weight (in lbs)	
Sex	
Program Information	
What date did you start attending Geri-Fit?	
How many sessions have you finished in Geri-Fit?	
In which city and state did you participate in Geri-Fit?	
Please tell us about your current condition(s).	Options: Yes, No
Have you had a hip or knee replacement in the past 5 years?	
Do you use a cane, walker, or wheelchair to get around?	
Do you have heart disease?	
Do you have diabetes?	
Do you have arthritis?	
Did Geri-Fit help lift your spirits or put you in a better mood?	
Did you lose any weight while enrolled in Geri-Fit?	
Are you able to raise your arms overhead better than when you first started in Geri-Fit?	
If you answered to yes to any of the conditions above (heart disease, diabetes, arthritis), would you say that any of your health conditions have improved since starting Geri-Fit?	
If you answered "yes" to the question about weight loss, how many pounds did you lose?	
Since starting Geri-Fit, please rate the following:	Options: Improved, The Same, Gotten Worse, Not Applicable or Never had this conditions
How is your mobility?	
How would you rate your health overall?	
How would you rate your overall strength?	
How would you rate your balance?	
How would you rate your ability to stand up without assistance?	
How would you rate your ability to walk without assistance?	
How would you rate your ability to walk up and down the stairs?	
How is your general well-being?	
How is your energy level?	

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How is your fear of falling down? Have you noticed any changes in your "pain"? (such as pain from arthritis, back pain, stiffness in joints) Have you noticed any change in your memory? Any changes in your driving skill and ability to turn your head around?	
Would you recommend the Geri-Fit program to your friends and family members?	Options: Yes, No
Final Thought and Comment. Such as your personal experience.	Open-ended, free response question.

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