

Exercise Adherence in Older Adults

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Abstract

BACKGROUND: The physical, cognitive, and psychosocial benefits of physical activity are well documented. Older adults have the lowest levels of physical activity, with only 11 percent meeting the minimum physical activity guidelines. Understanding the factors associated with exercise adherence may promote the development of more appealing exercise programs for the older adult population. **OBJECTIVES:** The purpose of this evidence-based review was to identify facilitators and barriers to exercise adherence in community-dwelling adults ages 65 and older. **METHODS:** The OVID Medline, CINAHL, and PsycINFO databases were searched with the key words exercise, barrier, facilitator, motivation, and compliance. **RESULTS:** Fourteen articles, including research agendas, review articles, meta-analyses, randomized experimental trials, quantitative cross sectional studies, and qualitative focus group studies were included for review. The quality of the studies varied. Study participants ranged in age from 50 to 100 years and reported various levels of physical activity. Results encompassed both intra-individual and extra-individual facilitators and barriers to exercise. Intra-individual barriers to exercise included a collection of health complications, social factors, physical limitations, and psychological concerns, while the facilitators included enhanced health, socialization, physical benefits, and psychological wellness. Extra-individual barriers included limited finances or resources, negative program or facility factors, and additional barriers such as competing commitments. Identified extra-individual facilitators included financial incentives, positive program or facility factors, and health care provider support. **CONCLUSIONS:** The participant's adherence is fundamental to the success of an exercise regimen. Research supports the utilization of comprehensive individualized interventions to enhance older adults' participation in exercise. Adherence may be enhanced through the creation of low cost, group-based exercise programs that incorporate the use of exercise prompts or other motivational tools, as well as health care provider support and education. Programs tailored to overcome the barriers and enhance the facilitators common in the older adult population will promote exercise adherence. Exercise participation and adherence will increase through the development of exercise regimens that meet the needs of older adults.

Keywords: Aging, Physical Activity, Exercise

1. Introduction

Adults over age 65 are the fastest growing population worldwide. These older adults report the lowest levels of exercise.¹ Exercise recommendations for older adults include performing 150 minutes of moderate-intensity aerobic activity per week along with twice weekly muscle-strengthening exercises.² Only 11 percent of adults 65 years of age and older meet the minimum exercise guidelines.³ Of the older adults participating in exercise, only 30 percent of older men and 15 percent of older women adhere to a regular exercise program.⁴

By 2030, 37 million adults over age 65 are expected to be managing more than one chronic condition.⁵ Exercise can decrease the risk or severity of various chronic conditions including heart disease, depression, type II diabetes, colon or breast cancer, obesity, and cognitive decline. Exercise also decreases falls and reduces the risk of an early death.² Additional benefits of exercise include improved functioning and strength, decreased dyspnea, reduced pain

levels and blood pressure, and positive psychological effects.⁶ In addition to the beneficial physical effects exercise may provide, exercise may also enhance the individual's general quality of life through the improvement of their overall health and functional abilities.

Due to these documented benefits, exercise regimens are being introduced for older adults. However, those that may receive the most benefit from physical activity are often the least likely to engage in exercise.⁴ The participant's adherence is fundamental to the success of any exercise program. The purpose of this literature review is to identify barriers and facilitators associated with community-dwelling older adults' adherence to exercise. The factors contributing to adherence must be considered in order to promote the physical activity of older adults.

2. Methods

The OVID Medline, CINAHL, and PsycINFO databases were searched for relevant articles using combinations of the key search terms: exercise, barrier, facilitator, motivation, and compliance. The search was limited to include articles that were published from 2002 to 2012, were written in English, had an abstract, and contained populations aged 65 years and older. This search strategy generated 168 articles from OVID Medline, 116 articles from PsycINFO, and 37 articles from CINAHL. After scanning the titles of the 321 articles generated, 44 duplicates were removed.

The first author reviewed the abstracts for eligibility, removing those articles containing exclusion criteria. Articles containing disease-specific populations (i.e. heart disease, osteoporosis) or those residing in nursing homes were removed to focus on the general population of community-dwelling older adults. Articles were limited to those with full-text availability, community-dwelling participants, and a mean age of 60 years and older. Studies that contained larger sample sizes and used elements of random selection or assignment were preferred. Poor quality studies (i.e. small convenience samples or qualitative studies) were excluded. A hand search of bibliographies generated an additional article, for a final 14 articles for review.

3. Results

Fourteen articles met the inclusion criteria and included a variety of research agendas, review articles, meta-analyses, randomized experimental trials, cross sectional studies, and focus group studies. The article topics included recommendations for research priorities for older adults' participation in exercise, perceived barriers and motivators to older adults' exercise, factors associated with exercise adherence in older adults, and interventions to enhance older adults' exercise adherence.

The studies included participants with a range of physical activity levels. Participants ranged in age from 50 to 100 years. Nine studies examined both older males and females, while two included only females. Sample sizes ranged from 66 to 2063 and comprised a total of 6770 participants. One focus group contained a small sample size and provided limited demographic information,¹ while other studies included larger sample sizes and elements of random sampling or assignment, which strengthened the evidence. These studies varied in length of intervention, as some studies were one-time questionnaires, while others contained interventions lasting up to 12 weeks⁷ or 3 months.⁸

While seven studies reported the barriers and motivating factors associated with older adults' physical activity,^{1,9-14} three more comprehensive articles, including a research agenda,¹⁵ review article,⁴ and meta-analysis,¹⁶ offered further insight as to the overall research regarding older adults' adherence to exercise. An additional four articles outlined specific factors or interventions that influenced exercise participation.^{7,8,17,18} Table 1 summarizes the purpose, design, sample, and setting for each study.

Table 1. summary of included studies

Author (year)	Purpose	Design & Randomization	Participants	Setting
Quantitative Studies				
Booth, Bauman, & Owen, 2002	Identify older adults' main barriers to physical activity	<ul style="list-style-type: none"> • Cross-sectional study • Face-to-face interviews • Random selection 	<ul style="list-style-type: none"> • n = 402 • Average age: Participants 60+ with no mean age reported • Female 55% 	Australia
Bruce, Devine, & Prince, 2002	Examine effects of fear of falling on physical activity levels in healthy older women	<ul style="list-style-type: none"> • Cross-sectional analysis using baseline data from longitudinal study • Random selection 	<ul style="list-style-type: none"> • n = 1500 • Average age 75.2 • Female 100 % 	Australia
Cohen-Mansfield, Marx, & Guralnik, 2003	Identify perceived barriers and motivators to exercise in older adults and examine related characteristics	<ul style="list-style-type: none"> • Mailed questionnaire • Non-random selection 	<ul style="list-style-type: none"> • n = 324 • Average age: 79 • Female 58 % 	United States
Cohen-Mansfield, Marx, Biddison, & Guralnik, 2004	Identify preferences regarding social and environmental aspects of exercise in the elderly population	<ul style="list-style-type: none"> • Mailed questionnaire • Non-random selection 	<ul style="list-style-type: none"> • n = 324 • Average age: 79 • Female 58 % 	United States
Conn, Burks, Minor, & Mehr, 2003	Investigate the effects of 2 interventions to increase older women's physical activity	<ul style="list-style-type: none"> • Randomized factorial experimental design • Non-random selection, randomized assignment 	<ul style="list-style-type: none"> • n = 190 women • Average age: 75.01 • Female 100 % 	United States
Croteau, Farmer, Jones, & Richeson, 2007	Investigate effects of a 12-week pedometer-based intervention and determine its effectiveness post-intervention	<ul style="list-style-type: none"> • Experimental repeated measures design with intervention and control groups • Random assignment 	<ul style="list-style-type: none"> • n = 147 • Average age: 72.9 • Female 78.2 % 	Maine and Florida, United States
Dacey, Baltzell, & Zaichkowsky, 2008	Examine physical activity motives for inactive, active, and sustained maintainers of exercise	<ul style="list-style-type: none"> • Exploratory factor analysis • Non-random selection 	<ul style="list-style-type: none"> • n = 645 • Average age: 63.8 • Female 59% 	United States
Lees, Clark, Nigg, & Newman, 2005	Identify exercise behavior barriers of older adults	<ul style="list-style-type: none"> • Focus group • Non-random selection 	<ul style="list-style-type: none"> • n = 66 in 6 focus groups • Average age: Participants 65+ with no mean age reported • Female: 86.4% 	Rhode Island, United States
Newson & Kemps, 2007	Identify motivational factors to older adults' exercise and future exercise intentions	<ul style="list-style-type: none"> • Mailed questionnaire • Non-random selection 	<ul style="list-style-type: none"> • n = 217 • Average age: 73.36 • Female 55.8 % 	Australia

Sarkisian, Prohaska, Wong, Hirsch, & Mangione, 2005	Explore effects that negative expectations of aging have on physical activity levels in older adults	<ul style="list-style-type: none"> • Cross-sectional survey • Non-random selection 	<ul style="list-style-type: none"> • n = 636 • Average age: 77.5 • Female 76.4 % 	California, United States
Schneider, Eveker, Bronder, Meiner, & Binder, 2003	Identify incentives and disincentives for participation in an exercise program	<ul style="list-style-type: none"> • Phone interviews • Content analysis • Non-random selection 	<ul style="list-style-type: none"> • n = 209 included • Average age: 82.7 • Female 70.3 % 	Midwest region, United States
Literature Reviews				
Prohaska, Belansky, Belza, Buchner, Marshall, McTigue, Satariano, & Wilcox, 2006	Develop a research agenda related to physical activity and aging	<ul style="list-style-type: none"> • Research agenda/ Review of literature 	<ul style="list-style-type: none"> • N/A 	N/A
Schutzer & Graves, 2004	Identify barriers and motivators as predictors to exercise adherence	<ul style="list-style-type: none"> • Review 	<ul style="list-style-type: none"> • N/A 	N/A
Meta-analysis				
Hong, Hughes, & Prohaska, 2008	Explore variables that predict exercise attendance and exercise completion among sedentary older adults	<ul style="list-style-type: none"> • Meta-analysis 	<ul style="list-style-type: none"> • 37 randomized controlled trials • 47 exercise groups • 2063 participants • Average age: 68.4 	Various

3.1. Adherence Factors

A variety of testing methods were utilized throughout the reviewed studies to evaluate the effects of various factors on older adults' adherence to exercise. Screening techniques included the *Mini-Mental State Examination* (MMSE),¹⁹ *Baecke Physical Activity Scale*,²⁰ a rating of perceived exertion, and the *Houston Physical Activity Scale*.²¹ Factors specific to older adults' exercise adherence were also identified through the use of health and exercise questionnaires, including a self-rated health *SF-36* questions,²² the *Geriatric Depression Scale* (GDS),²³ a modified pain questionnaire,²⁴ *Physical Activity Scale for the Elderly* questions,²⁵ and open-ended assessment questions.

The assessment tools identified factors associated with older adults' exercise adherence. In comparison to younger age groups who often cite physical appearance¹⁵ and stress management¹² as motivators and lack of time⁴ as a barrier, older adults are more motivated by their health^{12,15} and enjoyment¹² and inhibited by a poor health status.⁴ Both intra-individual and extra-individual barriers and facilitators were identified to influence the exercise adherence of older adults.

3.1.1. intra-individual barriers

Various intra-personal barriers to older adults' exercise adherence were identified. In general, women reported a greater average number of barriers.¹⁰ The most common barriers to physical activity were often correlated with a more depressed affect.¹⁰ Health and pain were reported as some of the most prevalent barriers, especially among women.¹⁰ An increased pain rating was often associated with a decreased self-efficacy for exercise.¹ Those identifying their health as a barrier to physical activity reported they could exercise more if they felt better physically. Participants that exercised more regularly reported health as a barrier less frequently. Pain,^{11,26} physical ailments, injury, disability,^{9,13} or other health concerns were commonly noted as hindrances to exercise adherence. Another barrier was the knowledge deficit regarding the effects of exercise on health.⁴

A lack of motivation or fatigue was also reported to hinder exercise.¹⁰ Inertia, defined as passivity, feeling bored, lazy, or too busy, was a common barrier in both exercisers and non-exercisers. It was the most common barrier

reported by exercisers in a 2005 focus group.¹ While inertia was the most common barrier for exercisers in this focus group, the fear of falling or injury was the most common reason reported for a lack of physical activity among the group of non-exercisers. The fear of falling was not mentioned in the focus group of exercisers.¹ In another larger study, with a randomly selected sample, one-third of non-exercising women reported a fear of falling, while one-fourth of the most active older women reported this fear.¹⁷ A fear of falling is reported as a common psychological barrier to exercise. Additional barriers included the belief that the participant was already active enough⁹ or that general activities of daily living (ADL) provided adequate exercise.⁴

3.1.2. intra-individual facilitators

An improved health or physical feeling was also identified as the most common intra-individual motivator to exercise.¹⁰ Those less physically fit, who reported more pain, selected health as a motivator more often. The participants that indicated health as a motivator also had higher GDS scores, representing an enhanced mood.¹⁰

Having someone to exercise with was also reported as a significant motivator to physical activity. Greater levels of exercise adherence were associated with social support¹⁵ and positive self-efficacy for exercise.^{4,15} Self-efficacy for exercise was lower in women and older participants.¹⁵ Other factors such as weight management,¹² knowing the benefits of the specific physical activity,^{4,15} and wanting to regain a previous physical ability¹⁴ increased adherence. In addition, a higher, more positive expectation for aging¹⁸ also enhanced exercise adherence.

3.1.3. extra-individual barriers

Extra-individual barriers reported in the literature included inadequate resources, such as transportation, clothing, equipment, and finances. Environmental factors, including safety concerns and bad weather,¹⁰ were also noted to interfere with opportunities for physical activity.^{4,15} Lacking time,¹⁰ being a caregiver,¹⁵ or dealing with life events and transitions also interfere with participation in exercise programs.¹⁵

3.1.4. extra-individual facilitators

Specific extra-individual aspects of exercise programs were found to enhance adherence. In these studies, group-based and resistance exercise programs were associated with higher attendance than individual, or aerobic exercise sessions.¹⁶ Exercise programs located in a facility, as opposed to home-based physical activity sessions, enhanced participation. Adherence to these programs increased when programs were low-cost,^{11,15} low-intensity,^{13,15} and convenient or accessible.^{11,13,15} Most participants ranked morning as their favorite time to exercise.¹¹ In addition, a quality instructor and participants of a similar age improved adherence.¹¹ Other aspects of an activity program, such as music played to decrease monotony and promote interest,^{4,11} as well as the social aspects of exercise¹¹ influenced participation as well.

Although research results differed, the length of an exercise program may affect exercise adherence. While some research indicated that longer exercise programs decreased adherence, other research supports future adherence if an exercise program is attended for three months or more.¹⁶ Further research on the length of an exercise program is needed to determine if attendance levels reach a plateau over time.¹⁶

Exercise adherence is enhanced if the program is monitored, evaluated, and supported by a healthcare professional.¹¹ Providers trained for exercise referral^{1,11,15} and program instruction⁴ increased the exercise adherence. Healthcare providers can work to help older adults overcome barriers to physical activity, as they are reported as the most effective person to provide the recommendation for exercise.⁴ Adherence was improved when physical activity education targeted participants' specific physical needs or disabilities.¹⁴

Other interventions were reported to facilitate the physical activity of older adults. The use of exercise prompts, including weekly telephone or mail prompting, enhanced older adults' participation in physical activity.⁸ The participants receiving these prompts increased their weekly exercise by an average of 37 minutes, in comparison to the control group that raised their exercise by only 12 minutes.⁸ In addition to the exercise prompts, other specific factors associated with exercise adherence, including the use of pedometers,⁷ were noted. Good weather and availability or free time¹⁰ were also associated with increased physical activity participation.

All fourteen articles supported older adults' participation in exercise. Since physical inactivity and a sedentary lifestyle are associated with functional decline and ADL disability,¹ the barriers and facilitators influencing older adults' exercise are important to address. Barriers were often correlated with facilitators. These identified factors can

be used to enhance exercise participation among older adults. Table 2 summarizes the reported barriers and facilitators to exercise adherence.

Table 2. summary of the facilitators and barriers to older adults' exercise

Facilitators	Barriers
Intra-Individual Factors	
Health <ul style="list-style-type: none"> •Enhance physical or mental capacity •Disease prevention •Minimize effect of specific diseases •Weight management •Increase energy •Stress management Social <ul style="list-style-type: none"> •Socialization •To make friends •Exercise companion Physical <ul style="list-style-type: none"> •Appearance •Weight loss Psychological <ul style="list-style-type: none"> •Self-challenge •To get out of the house •Enjoyment 	Health <ul style="list-style-type: none"> •Poor or decreasing health status •Physical limitations, disabilities, or pain Social <ul style="list-style-type: none"> •Disliking exercising alone Physical <ul style="list-style-type: none"> •Overweight or obese •Discomfort or shortness of breath with exercise •Fatigue or lack of energy •Slower timed up-and-go test Psychological <ul style="list-style-type: none"> •Lazy, unmotivated, or inertia •Unaware of physical capability, perceived capability •Fear of falling, injury, or other safety concerns •Shy or embarrassed, not the sporty type •Satisfaction with current level of activity •Negative affect, exercise not enjoyable •Knowledge deficit regarding benefits of exercise
Extra-Individual Factors	
Financial <ul style="list-style-type: none"> • Reduction of Medicare payments Program/Facility <ul style="list-style-type: none"> •Free or low cost •Quality of instructor, guidance, and supervision •Type of exercise •Proximity of location •Participants near own age for socialization •Inclusion of music Health Care Provider <ul style="list-style-type: none"> • Doctor's advice to exercise • Exercise evaluated by healthcare professional 	Financial <ul style="list-style-type: none"> • Lack of finances Program/Facility <ul style="list-style-type: none"> •Program rigidity or other negative program features •Dissatisfaction with program staff or supervision •Environment and safety concerns •Lack of suitable exercise facilities in the area Other <ul style="list-style-type: none"> •Lack of time or competing commitments •Lack of access to transportation •Inconvenience, life transitions, or caregiving duties •Poor weather, inadequate equipment or clothing

4. Discussion

This literature search revealed factors associated with older adults' adherence to exercise. Fourteen articles, including research agendas, review articles, meta-analyses, randomized experimental trials, cross sectional studies, and focus group studies offered insight to the facilitators and barriers of exercise. The results revealed clear evidence regarding the importance of tailored, comprehensive exercise interventions to meet older adults' needs.

Physical activity has been shown to delay ADL decline and reduce the risk of chronic health conditions that often occur with aging.¹ Exercise programs for older adults should address the barriers and facilitators identified in order to enhance physical activity participation.¹³ Exercise may be enhanced by minimizing the effects of barriers such as health problems,¹⁰ pain,^{1,11} fear of falling,^{1,17} lack of motivation¹⁰ or inertia,¹ and environmental safety concerns.^{4,15}

Facilitators to exercise include knowing the benefits of physical activity,^{4,15} improved health,¹⁰ social support,¹⁵ self-efficacy,^{4,15} weight management,¹² regaining previous physical abilities, and various components of exercise programs.^{11,13,15,16} Healthcare providers can promote exercise interventions for those at risk for functional decline or chronic disease. Providers can educate patients, as well as their caregivers, regarding the positive effects of exercise in older adults by providing specific information about exercise programs and facilities for referral.^{1,11,15}

The research supports the need for comprehensive measures to promote physical activity adherence. Both intra-personal and extra-personal factors associated with exercise adherence should be considered when designing a physical activity program to meet the needs of older adults. Managing health, pain, depression, and socialization can enhance participation.¹⁰ By altering exercise interventions to meet individualized needs,¹⁰ older adults may experience the additional benefits of physical activity.

While current research regarding exercise regimens for older adults is ongoing, this evidence-based review indicated several limitations in the available literature. The review included the findings of several small or non-randomized studies. Some research included self-reported exercise, which may influence the reliability of the study results.¹ In addition, less research regarding the factors associated with adherence to exercise has been conducted in patients 74 years of age and older.¹⁴ Generalizability was hindered due to the limited diversity among some of the samples, with the majority being Caucasian participants. In addition, the research focused primarily on urban-dwelling participants, the majority of which were female. This review was performed to synthesize the factors associated with older adults' adherence to exercise and was not an exhaustive review of the topic.

5. Summary and Conclusions

This literature review identified barriers and facilitators associated with older adults' adherence to exercise. In this review of three databases, OVID Medline, CINAHL, and PsycINFO, from 2002 to 2012, fourteen research-based articles were found on the topic. These articles included research agendas, review articles, meta-analyses, randomized experimental trials, quantitative cross sectional studies, and qualitative focus group studies. Findings support the utilization of comprehensive, individualized interventions for physical activities tailored to meet the needs of the older adult population.

The fourteen articles identified promote the utilization of the barriers and facilitators to exercise as mechanisms to enhance the physical activity of older adults. Health problems,¹⁰ pain,^{1,11} fear of falling,^{1,17} lack of motivation¹⁰ or inertia,¹ and environmental safety concerns^{4,15} are barriers that hinder older adults from exercising. Facilitators include improved health,¹⁰ social support,¹⁵ self-efficacy,^{4,15} weight management,¹² regaining previous physical abilities, various components of exercise programs,^{11,13,15,16} as well as knowing the benefits of physical activity.^{4,15} Referral and information from a healthcare provider offers an additional motivation for exercise.^{1,11,15} Utilizing these motivational factors, as well as aids such as pedometers⁷ and exercise prompts,⁸ may promote adherence to physical activity.

6. Recommendations for Research and Practice

Further research should be conducted on the facilitators and barriers to exercise within minority groups, or those residing in rural locations, as limited quality research has been conducted in this population. The majority of the research identified was conducted on white, urban-dwelling participants. In addition, less research has been conducted on participants 74 years of age and older.¹⁴ Future research findings may be more generalizable with large, randomly selected sample populations. Additional research regarding environmental factors that enhance exercise adherence may provide further insight.¹⁵ Long-term studies and randomized controlled trials regarding exercise adherence would strengthen the development of exercise regimens for older adults.

One of the reviewed studies discovered a possible correlation between a participant's physical activity level and their expectations for aging.¹⁸ This correlation offers an additional area for future research. Further longitudinal research may provide a potential intervention to raise expectations for aging, therefore influencing physical activity participation.¹⁸ In addition, since specific factors are reported to be associated with exercise initiation versus adherence or completion,¹⁶ further research as to these related interventions would offer additional insight.

Current research supports the need for exercise programs to be tailored to meet the needs of the older adult participants. Comprehensive exercise barriers and facilitators need to be addressed in order to promote exercise adherence. Older adults can benefit from the support and education of a health care provider trained to offer

referrals and specific physical activity instructions.^{4,15} Individualized education can be important in promoting adherence.¹⁴ Exercise instructors, as well as providers, may use exercise prompts to promote adherence.⁸ Other aids, such as the use of a pedometer, may also encourage increased physical activity.⁷ The creation of exercise regimens that meet the needs of older adults may enhance exercise participation and adherence.

7. Acknowledgements

The author would like to thank Dr. Kristine Talley for her guidance and mentorship. The project was funded by the University of Minnesota's Undergraduate Research Opportunity Program (UROP) grant.

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