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# *Effectiveness of Home-Based Physical Exercise for The Elderly: Endurance and Its Impact on Mobility and Functional Activities*

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## ABSTRACT

***Background**: Aging leads to decreased mobility and functional activity due to reduced muscle strength, balance, and endurance. Home exercise is a promising intervention to mitigate this decline. However, the role of endurance as a mediator in enhancing mobility has yet to be explored. **Objective**: This study analyzes the effectiveness of home physical exercise in improving mobility and functional activity in older adults, emphasizing endurance as a mediating factor. **Methods**: A systematic literature review (SLR) based on PRISMA guidelines was conducted, analyzing 116 relevant articles from academic databases. Studies were screened and selected based on inclusion and exclusion criteria, ensuring methodological rigor and relevance to the research topic. **Results & Discussion**: Findings indicate that home exercise significantly improves endurance, which, in turn, enhances mobility and functional performance. Increased endurance contributes to better movement efficiency, postural stability, reduced fatigue, and independence in daily activities. Key factors influencing the effectiveness of home exercise include the intensity and frequency of workouts, adherence, social support, underlying health conditions, and implementation methods. Despite its benefits, challenges such as physical limitations, lack of motivation, and environmental constraints hinder the sustainability of home exercise programs. **Conclusion**: Home exercise is an effective strategy for improving mobility in older adults, with endurance playing a crucial mediating role. Future interventions should focus on personalized exercise programs, social support, and technology integration to enhance adherence and maximize benefits.*

***Keywords**: Elderly, Endurance, Home-Based Exercise, Mediator, Mobility Improvement, PRISMA*

## INTRODUCTION

Aging is a natural and inevitable process experienced by individuals worldwide. According to projections, the number of people aged 60 and over is expected to increase from 1 billion in 2020 to 2.1 billion by 2050 (WHO, 2020). In the Asia-Pacific region, the elderly population is predicted to double, rising from 630 million in 2020 to about 1.3 billion by 2050. In Indonesia, the proportion of elderly people is also significantly increasing, from 13.6% in 2020 to approximately 25% by 2050. The number of elderly in Indonesia is projected to rise from 26.8 million in 2020 to 75 million by 2025, with a prevalence reaching 11.75% in 2023, which is equivalent to about 29 million individuals. This data indicates that Indonesia has entered the era of an aging population (Statistik, 2014). These figures are expected to continue growing alongside increasing life expectancy.

While this increase reflects advancements in health and social welfare, it also presents new challenges in maintaining the health and quality of life of the elderly, particularly concerning physical health, decreased mobility, and functional activity due to the aging process. One of the main issues faced by the elderly is the decline in physical abilities, including muscle strength, balance, and endurance, which ultimately impacts their independence in daily life (Pinho, 2020). The decline in physical fitness among the elderly can also lead to deteriorating physical health, reduced quality of life, and overall well-being.

As individuals age, they experience physiological changes, such as decreased muscle mass and bone density, which affect strength and balance, thereby increasing the risk of falls and injuries.


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Furthermore, decreased cardiovascular capacity leads to quicker fatigue during daily activities, which can reduce their independence (Yamada et al., 2021). Cardiovascular endurance refers to the ability of the cardiovascular and respiratory systems to support physical activity involving the entire body efficiently over a long period (Katrina et al., 2023). Maximum oxygen uptake ($VO_2$ max) decreases by 0.3–0.5 mL/kg/min per year in older adults (Fiana *et al.*, 2023). Consequently, many older adults experience limitations in mobility and functional activities, which can negatively affect their quality of life and increase dependence on others (Xu et al., 2024).

Endurance is a crucial component of physical fitness that influences older adults' ability to perform daily activities for extended periods without excessive fatigue. Improved endurance allows the elderly to maintain better mobility and functionality (Xu et al., 2024). Endurance-focused exercises help older adults remain independent. Research by Pinho (2020) states that fitness enables individuals to engage in physical activities in daily work because physical activity relates to functional abilities, including mobility and independence in personal activities without causing excessive physical fatigue while still being able to perform other tasks. Flexibility exercises can enhance the range of motion in the spine among older women, contributing to increased mobility and reduced injury risk (Pinho, 2020). Additionally, aerobic and strength training exercises are vital for improving overall fitness and balance, which, in turn, contribute to better performance in daily functional tasks (Costa, Ferreira and Bento, 2023).

Home exercise is an effective alternative, especially for older adults with limited access to fitness centers or challenges in following structured exercise programs. This approach allows them to stay active through simple routines without needing specialized equipment or professional supervision. Such programs can enhance participation and adherence among the elderly, while physical activity itself helps improve health, increase functional capacity, and reduce the risk of chronic diseases and physical limitations (Cerasola, Argano and Corrao, 2022). Physical exercise interventions at home are effective in improving physical fitness, including balance, muscle strength, and endurance in older adults (Lansky *et al.*, 2022). Therefore, it is essential to identify effective interventions for maintaining or improving mobility and physical function in the elderly population.

Research on the role of endurance in enhancing mobility and functional activity in older adults through home exercise remains limited, focusing more on the direct effects of exercise without considering mediating mechanisms. This study employs a systematic literature review approach based on PRISMA to review the literature on the effectiveness of home physical exercise. The research questions include the role of endurance as a mediator, factors influencing exercise effectiveness, implementation challenges, and opportunities for improving effectiveness. This study aims to provide a holistic overview of the mechanisms that enhance mobility and functional activity in older adults, generating valuable insights for health professionals in designing more effective and evidence-based exercise programs.

## METHODS

This study employs the PRISMA Systematic Literature Review (SLR) approach to analyze the role of endurance as a mediator in the impact of home-based exercise on mobility and functional activity in older adults. SLR is a systematic and structured method for identifying, assessing, and synthesizing relevant evidence, providing a comprehensive understanding of the relationship between home exercise and improvements in elderly function. The research process includes problem identification by formulating research questions and data collection from trusted academic databases such as ScienceDirect, Scopus, Google Scholar, PubMed, Web of Science, and IEEE Xplore. The search strategy will utilize keywords such as:

a. “home-based exercise” OR “exercise for elderly” AND “mobility improvement” AND “functional activity in older adults”
b. “endurance training” AND “elderly functional mobility” AND “exercise intervention for seniors”

The search will be conducted iteratively, with results filtered based on


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the following inclusion and exclusion criteria:

Inclusion Criteria:

a) Articles published in the last 5 years (2019-2024) for relevance.
b) Empirical and theoretical studies related to home exercise, endurance, mobility, and functional activity in older adults.
c) Peer-reviewed articles (academic journals, conference proceedings, and case studies).

Exclusion Criteria:

a) Articles irrelevant to the topic.
b) Articles without full access.
c) Opinion pieces, blogs, or those not based on empirical data.
d) Articles that provide only summaries without in-depth analysis.

The PRISMA method in this study ensures that the process of selecting and analyzing literature is conducted systematically, transparently, and accountably. This research is expected to make a significant academic contribution to understanding the role of endurance as a mediator in the impact of home exercise on mobility and functional activity in older adults. Additionally, this study may serve as an important reference for health practitioners and policymakers in designing more effective home exercise programs to enhance the quality of life for the elderly.

## RESULTS AND DISCUSSION

In this study, a total of 1,114 articles were identified from various sources, including 151 additional articles from other sources. After removing duplicates and applying inclusion and exclusion criteria, 1,032 articles remained after the initial selection process based on titles and abstracts. From this number, 807 articles were eliminated due to irrelevance or lack of full-text access. At the feasibility stage, 225 articles were analyzed, and 109 articles were excluded for not meeting the research criteria, leaving only 116 articles that met the inclusion criteria for qualitative analysis. These studies encompass regions in Southeast Asia, Europe, and North America, allowing for a comparative analysis of the effectiveness of home exercise in improving endurance, mobility, and functional activity in older adults. The PRISMA flow diagram for the article selection process is shown in Figure 1.

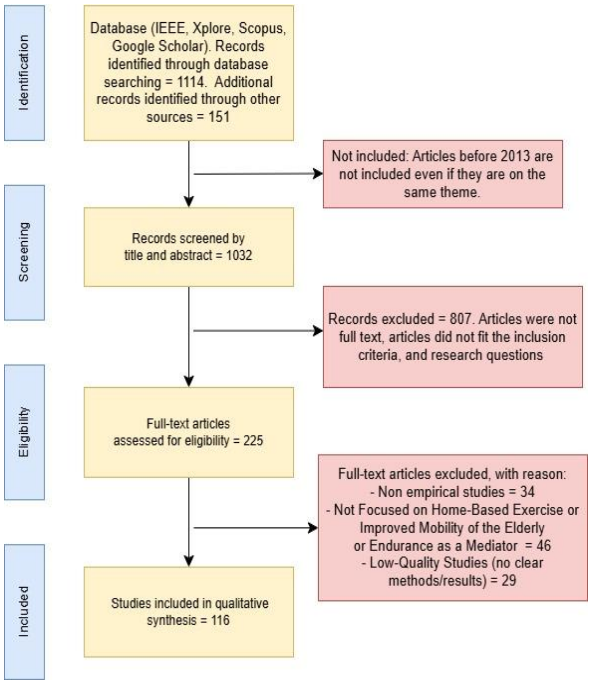


Figure 1 PRISMA Flow Chart

## Discussion

### The Role of Endurance as a Mediator in the Relationship Between Home-Based Exercise and Improved Mobility and Functional Activity

The results of the study indicate that home exercise has a positive impact on enhancing endurance, which then acts as a mediator in improving mobility and functional activity. Home exercise interventions are effective in improving physical fitness, including balance, muscle strength, and endurance in older adults. Increased endurance through home-based exercise directly enhances movement efficiency and postural stability in seniors (Santos *et al.*, 2024). Endurance supports the transition from passive exercise to independent functional activities (J. Wilson, 2020). Additionally, the Otago Home Exercise Program has been shown to improve both static and dynamic balance in older adults, contributing to mobility and a reduced fall risk (Nasri, 2020). Other studies indicate that the self-administered Otago exercise program can enhance muscle strength and balance, contributing to improved mobility (Rathi, 2022). Seniors who regularly engage in home exercise programs experience increased endurance, aerobic capacity, and muscle strength, which contribute to their functional


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capacity (T. Johnson, 2023). Active Range of Motion (ROM) exercises performed at home can improve joint flexibility, which is crucial for enhancing daily functional activities (Indrayana & Wahyudin, 2020).

Home exercise not only contributes to increased muscle strength but also to improved endurance, which is essential for maintaining daily functional abilities. This program also enhances the quality of life for seniors with osteoarthritis by improving physical fitness and reducing fatigue (Aiyegbusi *et al.*, 2024). Better endurance contributes to confidence in daily activities and reduces the risk of injury due to poor mobility (Lee et al., 2021). Seniors who regularly engage in home physical activities experience significant improvements in endurance, affecting their ability to perform daily tasks such as walking and climbing stairs (Martinez, 2021). Self-directed home exercise effectively improves lower limb function and mobility in older adults while enhancing endurance for daily activities (McGuigan, 2024).

One study highlights the importance of home exercise programs for individuals aged 80 and above with poor physical conditions (Zarpellon Mazo, 2024). These programs improve endurance and strength, contributing to independence and delaying the need for institutional care. Enhanced endurance also significantly boosts older adults' confidence in daily activities, making them more independent and active (Patel & Kumar, 2021). Furthermore, home exercises combined with cognitive approaches can improve balance and coordination, which in turn enhances mobility in older adults (Gracia, 2020).

Endurance is a key physiological factor that enhances mobility and functional activity in older adults undergoing home exercise programs. Physiologically, increased endurance in older adults is closely related to cardiovascular, neuromuscular, and metabolic adaptations that occur in response to physical activity (McGuigan, 2024). Regular physical exercise also enhances aerobic capacity, contributing to the efficient use of oxygen in body tissues (Zarpellon Mazo, 2024).

Cardiovascularly, structured home exercise can improve cardiac output and vascular elasticity, resulting in increased blood flow to muscles and enhanced energy metabolism efficiency (Santos *et al.*, 2024). Research shows that improved cardiovascular endurance from aerobic exercise can reduce the risk of early fatigue in older adults, allowing them to perform daily activities more easily (J. Wilson, 2020).

Neuromuscularly, resistance training helps maintain muscle mass and improves neuromotor function, which plays a role in postural stability and movement coordination (Lee et al., 2021). Decreased muscle mass (sarcopenia) can impair mobility; however, home exercise can mitigate muscle loss and improve neuromuscular coordination (Nasri, 2020).

Metabolically, increased endurance is associated with improved insulin sensitivity and energy metabolism efficiency, which are crucial for preventing fatigue and maintaining functional activity (Rathi, 2022). Older adults participating in home exercise programs experience increased metabolic capacity, enabling them to be more resilient in daily activities (Indrayana & Wahyudin, 2020).

Thus, the role of endurance as a mediator in home exercise is crucial for the mobility and functional activity of older adults. Cardiovascular, neuromuscular, and metabolic adaptations during exercise enhance endurance, allowing seniors to perform daily activities independently and productively. Improved endurance also positively impacts quality of life, independence, balance, and confidence. Therefore, a well-structured home exercise program, supported by education and guidance, can be an effective strategy for sustainably improving the health and well-being of older adults.

**Key Factors Affecting the Effectiveness of Home-Based Exercise in Improving Mobility and Functional Activity in the Elderly**

The results of the study indicate that several key factors contribute to the success of this exercise program, namely exercise intensity and frequency, participant compliance, social support, initial health condition, and the methods used in training.

**a) Exercise Intensity and Frequency**

Exercise intensity and frequency are primary factors determining the effectiveness of home exercise. Older adults who train at moderate to high intensity three to five times per week show


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significant improvements in balance and muscle endurance (McGuigan, 2024). Low to moderate intensity exercises are recommended for groups with more complex health conditions (Indrayana & Wahyudin, 2020). Regular exercise also contributes to improved lower limb strength and postural stability (Zarpellon Mazo, 2024). The Otago Exercise Program, conducted regularly over 12 weeks, can reduce fall risk and improve mobility in older adults (Nasri, 2020).

**b) Participant Compliance with the Exercise Program**

Compliance with the physical exercise program is key to the success of home exercise in enhancing mobility in older adults. Consistency in physical activity can improve fitness and reduce fatigue. Conversely, irregularity can lead to stagnation or even a decline in physical ability (Santos *et al.*, 2024). Compliance can be improved if the program is designed with simple and easy-to-follow instructions (P. Wilson et al., 2020). Providing clear guidelines and monitoring systems also plays a crucial role in increasing participant engagement (Johnson, 2023).

**c) Social Support and Motivation**

Motivation among older adults to engage in physical exercise is crucial for the effectiveness of home exercise programs. Older adults who are internally motivated, such as to maintain independence, tend to be more consistent in their routines, especially if they set realistic goals and receive rewards for small achievements (Meredith et al., 2023). Social support from family, friends, and healthcare providers also affects the success of the exercise. Older adults who receive encouragement and supervision from family members are more likely to comply, showing improvements in balance and mobility (Lee et al., 2021). Those who exercise with family experience greater endurance gains compared to those who exercise alone (Jansons et al., 2022). This emotional and social support contributes to motivation and consistency in maintaining exercise routines (Raray, 2024).

**d) Initial Health Condition**

The initial health condition of older adults plays a role in determining the effectiveness of home-based physical exercise. Individuals in better health before starting an exercise program are likely to experience more significant improvements than those with chronic illnesses or more severe mobility limitations. Older adults with a history of conditions such as osteoarthritis or osteoporosis require tailored exercise programs to avoid injury (McGuigan, 2024). Therefore, a careful health assessment before starting an exercise program will help design safe and suitable training for each individual's physical condition.

**e) Environment and Resource Access**

The living environment of older adults also influences the success of home exercise programs. A safe and adequately spacious area for exercising can enhance participation among seniors. Access to resources such as mats, light dumbbells, or other assistive devices can facilitate the exercise program. However, if resources are limited, exercises without equipment or using body weight can still be designed to be effective (Latham, 2020).

**f) Exercise Methods Used**

The types and methods of exercise implemented affect the success of home exercise programs. A combination of balance, strength, and flexibility training is more effective than exercises focusing solely on one aspect (Nasri, 2020). Exercises using technology-based methods, such as instructional videos or exercise apps, can increase engagement among seniors and yield better results than traditional methods (Wilson, 2020). Interactive training methods, such as gamified programs or mobile applications, can enhance motivation and participation in physical activities among older adults (L. Johnson, 2023).

Based on the findings of this study, several key factors influence the effectiveness of home physical exercise in improving mobility and functional activity in older adults. This research reinforces that home physical exercise is an effective strategy for enhancing the quality of life for seniors. Developing programs that consider these factors will improve the success of physical exercise interventions and provide long-term benefits for the elderly population.

**Challenges in Implementing Home-Based Exercise for the Elderly**

The implementation of home exercise for older adults faces various challenges that affect the effectiveness and consistency of the program, including


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physical, psychological, social, and environmental aspects.

**a) Physical and Health Challenges**

One of the main challenges in implementing home exercise for the elderly is physical limitations due to declining bodily functions with age (Santos *et al.*, 2024); Valenzuela et al., 2023). Many elderly individuals have complex health conditions, such as osteoarthritis, hypertension, diabetes, sarcopenia, or cardiovascular disorders, which can limit their ability to engage in physical exercise and lead to lower adherence to home exercise programs due to mobility limitations and fatigue (Lee et al., 2021; Nasri, 2020; Rathi, 2022). Elderly individuals with certain medical conditions require tailored exercises to avoid negative side effects (Indrayana & Wahyudin, 2020). Reduced endurance also poses a significant barrier to physical exercise at home. Elderly individuals with balance disorders are at high risk of falling while exercising unsupervised (Wilson, 2020). Postural instability can cause older adults to avoid physical activity, resulting in decreased mobility and functional activity (Johnson, 2023).

**b) Psychological and Motivational Challenges**

Psychological factors such as lack of motivation and self-confidence are obstacles to home exercise implementation. Many elderly people doubt their ability to perform exercises correctly without professional supervision (Koh et al., 2022). Fear of injury and the perception that exercise does not provide immediate benefits can also hinder participation (Barton *et al.*, 2021). Furthermore, depression and anxiety, which are commonly experienced by the elderly, contribute to low participation rates (Coletta *et al.*, 2024). Elderly individuals experiencing social isolation are more likely to lose motivation for exercise, especially when there is no external encouragement from family or healthcare workers (Schrempft et al., 2019).

**c) Social Challenges and Environmental Support**

Social support from family and the community significantly affects the success of home exercise for the elderly (Steinhoff & Reiner, 2024). The motivation of elderly individuals to engage in physical activity is influenced by intrinsic factors, such as perceived health benefits, and extrinsic factors like family support and guidance from health professionals. Without this support, seniors are less likely to stay motivated (Meredith et al., 2023). Additionally, elderly individuals living alone often struggle to understand exercise instructions (Lee et al., 2021). The lack of professional guidance during exercise poses a significant challenge, as many lack access to trainers or physiotherapists; exercising unsupervised increases the risk of injury from incorrect movements and reduces the effectiveness of the exercise (T. Johnson, 2023; McGuigan, 2024; J. Wilson, 2020).

Environmental factors also play a crucial role in the success of home exercises. Limitations such as insufficient space, lack of assistive devices, slippery floors, and poor lighting pose significant barriers (Lee et al., 2021). Access to technology is another critical factor; limited access can hamper the success of app-based exercise programs or video tutorials (J. Wilson, 2020). A supportive environment, including access to necessary equipment and clear instructions, is essential for effective implementation (Zarpellon Mazo, 2024).

**d) Challenges in Exercise Adherence and Consistency**

Consistency in exercise routines is a crucial factor in the effectiveness of home exercise, yet a primary challenge is the lack of motivation and adherence among the elderly in following programs (Collado-Mateo *et al.*, 2021). Many elderly individuals struggle to maintain long-term exercise habits due to a lack of structure in their programs (Meredith et al., 2023). Changes in health conditions and the absence of medical supervision decrease adherence, especially for those without a regular schedule, who tend to discontinue their exercise programs quickly. A limited understanding of the importance of ongoing exercise further exacerbates this situation (P. Wilson et al., 2020).

**e) Lack of Digital Literacy**

The lack of digital literacy and access to information sources about physical exercise presents a barrier to implementing home exercise for the elderly (Lansky *et al.*, 2022). With the advancement of technology, many physical exercise programs are now available in digital formats, such as exercise videos or mobile applications (Johnson, 2023).


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However, only a small fraction of the elderly possess adequate technological skills to independently access these resources (Santos *et al.*, 2024). Limited understanding of technology can prevent the elderly from fully benefiting from digital-based exercise programs (Wilson et al., 2020).

This challenge requires a holistic approach involving family support, healthcare engagement, and the provision of appropriate resources to ensure the sustainability and effectiveness of exercise programs for the elderly.

**Strategic Opportunities to Improve the Effectiveness of Home-Based Exercise Implementation for the Elderly**

This challenge requires a holistic approach involving family support, healthcare engagement, and the provision of appropriate resources to ensure the sustainability and effectiveness of exercise programs for the elderly.

**a) Appropriate and Varied Exercise Program Design**

The design of an appropriate exercise program is essential for improving the effectiveness of home workouts for the elderly. Programs that consider the physical abilities, health conditions, and preferences of the elderly can enhance participation and adherence. Research shows that programs involving strength, balance, and flexibility exercises are more effective than those focusing solely on one type of exercise. Therefore, organizers need to develop varied programs tailored to the physical conditions of each elderly individual. Exercises like squats, lunges, and stretching help the elderly maintain flexibility and strength without requiring expensive equipment. Incorporating various aspects of physical health is crucial to avoid boredom, increase motivation, and reduce the risk of injury (Latham, 2020).

**b) The Importance of Social Support from Family or Caregivers**

Support from family or caregivers is crucial for the success of home exercise programs. Supervision from family members can enhance adherence among the elderly, while training on the importance of physical activity can strengthen program effectiveness. Emotional support and motivation from family help the elderly stay motivated and consistent (Steinhoff & Reiner, 2024). Good communication between the elderly and their families ensures that exercises are performed regularly, with family members acting as supervisors who monitor progress (Jansons et al., 2022). Therefore, training caregivers on how to support the elderly in exercising is an important strategy for improving program effectiveness.

**c) Monitoring Utilization of Technology for Instruction and Monitoring**

The use of technology—such as smartphone apps, wearable devices, or websites—can enhance the effectiveness of home exercise for the elderly by providing video instructions, real-time feedback, and assistance in tracking progress, adjusting workouts, and reminding them to exercise regularly. These digital platforms also allow for real-time, objective data monitoring, providing useful feedback for users (Ke *et al.*, 2025). Additionally, wearable devices like activity trackers or smartwatches can monitor exercise intensity, heart rate, and the number of steps taken by the elderly, offering valuable feedback for both program managers and the participants. Kim et al. (2025) found that integrating activity trackers with home exercise interventions improved fear of falling and physical function. This technology also enables trainers to provide immediate assistance when needed. Although challenges such as technical issues and adherence exist, feedback from apps has proven beneficial in enhancing motivation and participant engagement (Chan *et al.*, 2021).

Help the elderly adapt to these devices, several solutions can be implemented. First, providing clear tutorial videos will assist in understanding how to use the apps and wearable devices (Chan *et al.*, 2021). Additionally, forming support groups where the elderly can share experiences and tips can enhance their skills. Implementing a reward system to encourage device usage, along with periodic short training sessions to refresh skills, are also effective strategies. Designing user-friendly app interfaces with larger text and high-contrast colors, and involving family members in the training process, can further improve motivation and ease of use. By leveraging technology, exercise programs can be made more flexible and accessible (McDermott et al., 2018).


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**d) Development of Education and Training Programs for the Elderly**

An important strategy to enhance the effectiveness of home exercise is to educate the elderly about the benefits of physical activity and how to do it safely. This education can include proper techniques, optimal timing for exercising, and recognizing bodily signals to prevent injuries. Elderly individuals who receive guidance before starting an exercise program are more likely to adhere to it and have higher confidence. Educational programs can be delivered through various media, including face-to-face interactions, tutorial videos, or apps that provide step-by-step guidance, making accessibility easier for those who have difficulty attending live training (Katrina et al., 2023).

**e) Periodic Evaluation and Monitoring**

Periodic evaluation and monitoring are essential to ensure that home exercises are performed correctly and achieve the desired results. This process involves assessing the physical progress of the elderly, the effectiveness of the exercises, and their responses to the program. Routine monitoring of muscle strength, flexibility, and balance helps program managers adjust the difficulty levels of the exercises accordingly (Kelly, 2022). Additionally, this evaluation boosts the elderly's confidence and allows for the detection of any decline in physical condition that may require attention (McAuley, 2021).

Monitoring can be conducted through simple at-home tests or using wearable devices to track daily progress. Periodic evaluations also provide useful feedback for adjusting programs to meet the needs of the elderly, such as reducing exercise intensity if necessary. These adjustments can enhance adherence and motivation (Kelly, 2022).

**f) Recording Progress and Reward Programs**

Recording progress is an effective strategy to enhance the motivation of the elderly to engage in physical activities at home. By documenting each exercise session—such as duration, type of activity, and achievements—the elderly can see the progress they are making. This creates opportunities to celebrate small successes, such as consistently completing workouts each week. Small rewards, such as gifts or items they enjoy, as well as affirmations of achievements from family or friends, can also serve as significant forms of recognition. This not only provides a sense of accomplishment but also makes home exercise more enjoyable. Thus, tracking progress, implementing a reward system, and affirming achievements are valuable tools in building healthy habits and reinforcing the elderly's commitment to physical exercise at home (Physical Activity Guidelines for Americans, 2018).

## RESEARCH LIMITATIONS

One limitation of this research is the limited access to research sources, which makes it difficult for researchers to obtain relevant literature. Additionally, there is publication bias, whereby only studies with positive results are available to researchers. This can affect the conclusions drawn. The varying quality of studies is also a limitation, as some studies have diverse designs or sample sizes, which can reduce the validity of the data. Therefore, it is important to consider all these factors when evaluating the validity and relevance of future research findings.

## CONCLUSION

Home exercise can significantly improve endurance, which plays a mediating role in enhancing mobility and functional activity in the elderly. Improved endurance increases movement efficiency, postural stability, and reduces fatigue, thereby helping to enhance mobility and functional capacity. The effectiveness of exercise is influenced by factors such as exercise intensity and frequency, participant adherence, social support and motivation, initial health conditions, environment and access to resources, as well as the methods of exercise employed. Moderate to high-intensity exercise performed regularly yields more significant results, especially when supported by social support.

However, implementing home exercise programs for the elderly faces various challenges, including physical limitations and complex health issues, lack of motivation and self-confidence, limited social support, inadequate environments, and low digital literacy, which hinder access to technology-based exercise programs. Additionally, a lack of clear structure in exercise routines often leads


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to low adherence and inconsistent workout habits.

This research also identifies several strategic opportunities to enhance the effectiveness of home exercise implementation for the elderly. One of these is designing varied exercise programs tailored to the physical conditions and preferences of the elderly to increase participation and adherence. Social support from family or caregivers also plays a crucial role in the success of exercise programs. Furthermore, the use of technology—such as exercise guidance apps and wearable devices—can help the elderly follow instructions and monitor their exercise progress independently. Education and training on the benefits and safe execution of exercises can boost the confidence and adherence of the elderly to their exercise routines. Periodic evaluation and monitoring of physical progress and satisfaction levels are also important for adjusting programs to achieve greater effectiveness.

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