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Effectiveness of community-based physical activity programs on physical function and health outcomes among older adults: a systematic literature

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ABSTRACT

Population aging has intensified the global burden of functional decline, falls, and chronic disease, positioning community-based physical activity programs as a scalable strategy for independence in later life. This review examined the effectiveness of community-based physical activity programs on physical function and health outcomes among community-dwelling older adults, and the characteristics linked to better outcomes. The review followed the PRISMA 2020 framework, with a structured search of the Scopus database yielding 180 records. After removal of duplicate records and sequential title, abstract, and full-text screening against predefined eligibility criteria that prioritized experimental and comparative designs, English-language original articles published between 2017 and 2026, and community-dwelling older-adult populations, 12 studies were included in the final synthesis. Methodological quality was appraised with design-specific tools. Across the included studies, supervised multicomponent and resistance-based programs produced the most consistent gains in muscle strength, gait speed, and functional performance, whereas walking-only and low-intensity formats yielded smaller or condition-dependent effects, with adherence a decisive moderator. The review advances an evidence-informed account of how program design shapes functional benefit and offers practical guidance for sustainable community exercise services. Future trials should adopt harmonized outcome measures and longer follow-up to strengthen the evidence base.



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Introduction

Global population aging has become one of the defining demographic transitions of the present century, and it carries profound implications for how societies sustain health and functional independence in later life. As the proportion of older adults expands, the prevalence of physical inactivity and its downstream consequences, including obesity, diabetes, and hypertension, continues to rise across both high-income and resource-constrained settings (Bockarie et al., 2025). Physical activity is widely recognized as a modifiable determinant of healthy aging, exerting protective effects on functional capacity, cardiometabolic health, and psychological wellbeing (Tomas et al., 2017). Diverse activity modalities, ranging from structured exercise to culturally embedded forms such as dance, have been advocated as accessible pathways to preserve health among older

populations (Waugh et al., 2024). Understanding how to translate this evidence into sustainable community practice therefore represents a pressing scientific and public-health priority.

The specific challenge that motivates this review is the age-related erosion of physical function, which manifests as declining muscle strength, slower gait, impaired balance, and heightened fall risk. Reduced grip strength, low fall efficacy, and diminished balance confidence have each been linked to elevated fall risk among community-dwelling older adults (Marconcin et al., 2025). Functional, cognitive, and sleep-related factors interact to shape the probability of falls during daily life, underscoring the multidimensional nature of the problem (Tavares et al., 2026). Advances in assessment, including machine-learning approaches to gait-stability prediction, have further clarified how subtle balance deficits accumulate with age (Zhou & Shi, 2026). These converging lines of evidence establish physical function as a central and measurable target for preventive intervention in older populations.

A substantial body of research has responded to this challenge by developing community-based physical activity programs that deliver exercise opportunities outside clinical settings. Large natural experiments such as the Recreovia in Bogota demonstrated that open, community-delivered programs could reach women and older residents at scale (Sarmiento et al., 2017). Participatory evaluations of comparable Colombian programs highlighted multilevel and sustained community impacts (Rubio et al., 2022), while mixed-methods evaluations of programs designed specifically for older adults documented both feasibility and acceptability (Mellow et al., 2022). Program-level evaluations have also reported meaningful gains in mobility and psychosocial health among participating seniors (Arnett et al., 2019). Collectively, this literature affirms that community delivery is viable, yet it also reveals wide variation in program structure and evaluated outcomes.

Recent trends have diversified both the content and the delivery of community exercise. Supervised multicomponent programs combining resistance, impact, and balance training have been implemented in real-world leisure centers to target musculoskeletal health (Daly et al., 2020). Digital and wearable technologies have been integrated to support activity maintenance beyond supervised sessions (Brickwood et al., 2021), and digitally delivered fall-prevention programs have begun to demonstrate usability and feasibility for older users (Moran et al., 2025). Delivery format also appears to interact with sex and social preference, with group and solitary formats associated differentially with mental health among older adults (Tomioka et al., 2026). These developments signal a shift from single-mode interventions toward flexible, technology-augmented, and preference-sensitive models of community exercise.

Despite this progress, the evidence base remains fragmented and its effectiveness conclusions are inconsistent. Trials of gait and functional fitness have reported that different exercise protocols can be similarly effective, complicating the identification of active ingredients (Ramalho et al., 2018). Low-intensity modalities intended for frail participants have produced equivocal effects on physical performance despite good adherence (Tou et al., 2024). A recent systematic review of community-based models likewise concluded that quality-of-life benefits are promising but heterogeneous across program types (Qadrijati et al., 2026). This inconsistency indicates a genuine gap in synthesized knowledge about which programs, delivered how, produce reliable functional benefit for older adults.

A second gap concerns the implementation and program-level characteristics that govern whether benefits are realized and sustained. Recruitment, sustainability, and scalability are recurrent barriers identified by program stakeholders (O'Regan et al., 2020), and shifting ownership from academic teams to communities requires deliberate iterative design (Harden et al., 2021). Intervention fidelity is frequently under-specified, limiting replication and interpretation (Bird et al., 2020), while linkages between clinical services and community programs remain underdeveloped (Fishleder et al., 2018). These methodological and translational limitations mean that effectiveness cannot be understood in isolation from the delivery conditions under which programs operate.

Taken together, the demographic urgency, the centrality of physical function, the proliferation of heterogeneous programs, and the persistent implementation gaps justify a rigorous, PRISMA-guided synthesis focused specifically on community-dwelling older adults (Page et al., 2021). By concentrating on experimental and comparative evidence and by extracting both outcome effects and program characteristics, this review seeks to move beyond cataloguing individual trials toward an integrated account of what works. Prior program evaluations have often examined outcomes such as outdoor mobility in isolation (Salbach et al., 2024), leaving the comparative picture unresolved. Accordingly, this review addresses two research questions that structure the synthesis and its contribution to evidence-based practice for active aging.

RQ1: How effective are community-based physical activity programs in improving physical function among community-dwelling older adults compared with usual care or control interventions?

RQ2: Which characteristics of community-based physical activity programs (for example, exercise type, frequency, duration, and delivery format) are associated with better health outcomes in older adults?

Method

Research Design and Framework

A systematic literature review design was adopted because it provides a transparent, replicable, and rigorous means of synthesizing evidence to answer focused questions, and it is well suited to appraising a heterogeneous body of intervention studies (Tranfield et al., 2003). The review conformed to the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) 2020 statement, which specifies standards for search, screening, and reporting (Page et al., 2021), and it drew on the earlier PRISMA formulation for continuity of methodological practice (Moher et al., 2009). The design prioritized experimental and comparative evidence so that inferences about effectiveness could be grounded in studies with a comparison condition or a defined pre-post structure.

Search Strategy

Prior to constructing the search string, the review questions were decomposed using the PICOS framework (Population, Intervention, Comparison, Outcome, Study design) to ensure systematic identification of key concepts. Each element was translated into a cluster of synonyms that were combined with Boolean operators. The PICOS structure is summarized in Table 1.

Table 1. PICOS framework guiding the search strategy

Component	Criteria
Population (P)	Community-dwelling older adults (aged 60 years and older, or as defined by the study).
Intervention (I)	Community-based physical activity or exercise programs, including walking groups, group exercise, resistance training, balance training, and multicomponent exercise delivered in community settings.
Comparison (C)	Usual care, no intervention, a control group, or an alternative exercise condition.
Outcome (O)	Primary: physical function (muscle strength, gait speed, balance, mobility). Secondary: quality of life, falls and fall-related outcomes, physical activity level, and functional independence.
Study design (S)	Randomized controlled trials, quasi-experimental studies, controlled or non-randomized comparative studies, and pre-post intervention studies.

The Boolean search string combined the population and intervention concepts, applying truncation to capture lexical variants and the TITLE-ABS-KEY field code to restrict retrieval to the title, abstract, and keyword fields. The wildcard in elder* captured elder and elderly, while quotation marks preserved multi-word phrases. The string was piloted and refined iteratively; an initial broad version returned an unmanageable volume of tangential records, after which the intervention cluster was tightened to community-delivered activity. The final string was:

("community-based physical activity program" OR "community exercise program" OR "community-based exercise") AND ("older adults" OR elder* OR aged OR senior*) AND (exercise OR "physical activity" OR "physical function" OR "functional fitness")

Database and Information Sources

Scopus served as the primary and authoritative bibliographic source because of its broad multidisciplinary coverage of peer-reviewed literature in health, sport, and rehabilitation sciences. The search was executed on 6 September 2026 and covered the publication window from 2017 to 2026. All bibliographic metadata used for the selection process, the flow diagram, and the description of included studies were derived directly from the Scopus export, ensuring traceability of every record.

Eligibility Criteria

Eligibility was defined a priori. Studies were included when they reported a community-based physical activity or exercise intervention delivered to community-dwelling older adults and measured physical function or a related health outcome using an experimental or comparative design. The full criteria are presented in Table 2.

Table 2. Inclusion and exclusion criteria

Criterion	Inclusion	Exclusion
Language	English	Non-English
Document type	Original research article	Review, conference paper, book chapter, editorial, protocol
Publication period	2017-2026	Before 2017

Criterion	Inclusion	Exclusion
Source type	Peer-reviewed journal (final stage)	Non-journal or non-final records
Population	Community-dwelling older adults	Institutionalized or exclusively young populations; single narrowly defined acute clinical rehabilitation samples
Intervention	Community-based physical activity or exercise program	Purely clinical or hospital-based rehabilitation; non-activity interventions
Outcome	Physical function or related health outcome	Outcomes limited to attitudes, recruitment, or process only
Design	RCT, quasi-experimental, controlled comparative, pre-post	Cross-sectional survey, qualitative-only, scoping or systematic review

Study Selection Process

Selection proceeded in sequential stages. After duplicate records were removed, titles and abstracts were screened against the eligibility criteria, and potentially relevant reports were retrieved for full-text assessment. Each full text was evaluated for final inclusion, and exclusions at this stage were documented with reasons. Where screening decisions were uncertain, records were retained for full-text review to minimize premature exclusion, and disagreements were resolved through discussion until consensus was reached. Screening and eligibility assessment were conducted independently by two reviewers at both the title-and-abstract and full-text stages. Inter-rater agreement was calculated using Cohen's kappa (Cohen, 1960) and yielded $\kappa = 0.83$ for title-and-abstract screening and $\kappa = 0.86$ for full-text eligibility assessment, both indicating strong concordance by the benchmarks of Landis and Koch (1977). This review was not prospectively registered with PROSPERO; the research questions, eligibility criteria, search strategy, appraisal tools, and synthesis method were specified in the review protocol prior to data extraction and applied without modification throughout.

Quality Assessment and Critical Appraisal

Methodological quality was appraised independently of the search strategy using design-specific critical appraisal tools, so that each study was evaluated with the instrument most appropriate to its design rather than a single tool applied uniformly. Randomized controlled trials were appraised with the revised Cochrane Risk of Bias tool (Sterne et al., 2019); non-randomized and quasi-experimental studies were considered against ROBINS-I (Sterne et al., 2016) and the Joanna Briggs Institute checklists (Aromataris & Munn, 2020); and any mixed-methods components were appraised with the Mixed Methods Appraisal Tool (Hong et al., 2018). Rather than reducing quality to a single numerical score, methodological strengths and limitations were carried into the synthesis, and studies with greater concerns were interpreted with additional caution. Where appraisal was conducted by more than one reviewer, agreement was interpreted using the Landis and Koch classification (Landis & Koch, 1977). A summary of the appraisal is presented in Table 3. Quality appraisal was conducted independently by two reviewers. Inter-rater agreement for appraisal decisions yielded $\kappa = 0.81$, indicating strong agreement. Disagreements on individual checklist items were resolved by discussion; where consensus could not be reached, a third reviewer provided a deciding opinion.

Table 3. Summary of methodological quality appraisal of the included studies

Author(s), Year	Study Design	Appraisal Tool	Overall Interpretation
Hongu et al., 2019	Single-group pre-post	JBQI Quasi-Experimental	Moderate
Lee et al., 2021	Randomized controlled trial	Cochrane RoB 2	Low risk of bias
Tou et al., 2024	Randomized controlled trial	Cochrane RoB 2	Low risk of bias
Ramalho et al., 2018	Quasi-experimental	JBQI Quasi-Experimental	Moderate
André et al., 2020	Single-group pre-post	JBQI Quasi-Experimental	Moderate
Arnett et al., 2019	Single-group longitudinal	JBQI Quasi-Experimental	Moderate
Middleton et al., 2023	Non-randomized controlled	ROBINS-I / JBQI	Moderate
Shivgulum et al., 2025	Single-group pre-post	JBQI Quasi-Experimental	Moderate
Daly et al., 2020	Randomized controlled trial	Cochrane RoB 2	Low risk of bias
Brickwood et al., 2021	Randomized controlled trial	Cochrane RoB 2	Some concerns
Salbach et al., 2024	Randomized controlled trial	Cochrane RoB 2	Low risk of bias
Kang et al., 2026	Pilot randomized controlled trial	Cochrane RoB 2	Some concerns

Data Extraction Procedure

A structured extraction form was used to capture the following fields from each included study: author and year, country and setting, study design, sample characteristics, intervention content and dosage, comparator, outcome measures, and principal findings. Extraction was performed directly from the primary reports to preserve fidelity to the original data, and extracted items were cross-checked against the full texts before synthesis.

Data Analysis and Synthesis

Given the heterogeneity of designs, populations, and outcome measures, a narrative thematic synthesis was adopted rather than statistical meta-analysis. Following established guidance for thematic synthesis, findings were coded, grouped into descriptive themes, and developed into analytical themes aligned with the two research questions (Thomas & Harden, 2008). Convergent and divergent findings were compared across studies, and program characteristics were examined as potential moderators of effect. Bibliometric description of publication years, geographic origin, and outcome domains complemented the narrative synthesis and is presented graphically in the results.

Reporting and Documentation

Reporting followed the PRISMA 2020 checklist to ensure completeness and transparency across the search, screening, and synthesis stages (Page et al., 2021). The selection process is documented in the flow diagram presented in the results, and all quantitative selection figures are reported consistently across the manuscript.

Results and Discussions

Study Selection Results

The database search identified 180 records in Scopus. After 14 duplicate records were removed, 166 records were screened by title and abstract, of which 121 were excluded as clearly irrelevant to community-based physical activity in older adults. Forty-five reports were sought for retrieval, and three could not be obtained in full text, leaving 42 reports assessed for eligibility. At the full-text stage, 30 reports were excluded: eight did not evaluate a community-based physical activity intervention, eleven used an ineligible study design, eight involved an ineligible population, and three reported outcomes outside the review scope. Twelve studies met all criteria and were included in the final synthesis. The selection process is depicted in Figure 1.

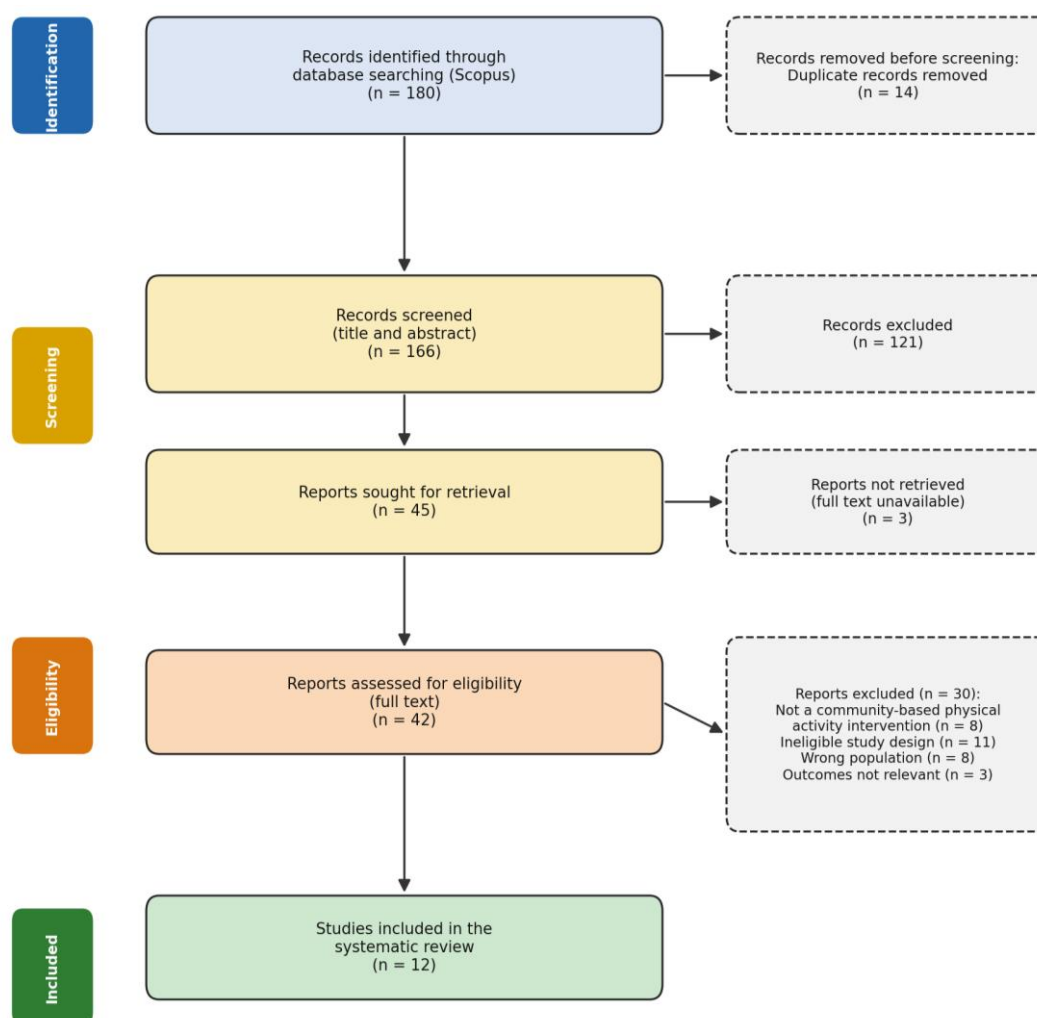


Figure 1. PRISMA 2020 flow diagram of the study selection process

Descriptive Characteristics of the Included Studies

Screening inter-rater agreement was $\kappa = 0.83$ for title-and-abstract and $\kappa = 0.86$ for full-text assessment; quality appraisal agreement was $\kappa = 0.81$. Quality appraisal results (Table 3) indicate that 5 of 12 studies were rated Low risk of bias (all RCTs: Lee et al., 2021; Tou et al., 2024; Daly et al., 2020; Salbach et al., 2024; and one with Some concerns: Brickwood et al., 2021; Kang et al., 2026), and 6 were rated Moderate quality (quasi-experimental and single-group designs). Meta-analysis was not conducted due to clinical heterogeneity across 4 distinct exercise modalities (resistance, multicomponent, walking-only, low-intensity), 6 different primary outcome instruments, and intervention durations ranging from 6 weeks to 18 months. Narrative thematic synthesis was the appropriate analytical choice, enabling directional pattern recognition across heterogeneous study types without requiring commensurable metrics. The 12 included studies were published between 2018 and 2026 and originated from eight countries across four continents, reflecting a geographically diverse but Western-weighted evidence base. Randomized controlled trials constituted half of the corpus, complemented by quasi-experimental, non-randomized controlled, and single-group pre-post designs. Sample sizes ranged from small pilot cohorts to multi-site trials exceeding three hundred participants. The full characteristics of each study are presented in Table 4, and a classification by theme, design, and outcome is provided in Table 5.

Table 4. Characteristics of the included studies

Title	Author(s)	Year	Country	Design	Key Findings
Promoting stair climbing as an exercise routine among healthy older adults attending a community-based physical activity program	Hongu et al.	2019	Japan	Single-group pre-post	Daily walking and stair-climbing steps increased significantly after 6 months ($p \leq 0.01$); in men, stair-climbing steps correlated with leg muscle strength ($r = 0.428$). Stair climbing was a feasible routine to raise daily activity in healthy older adults. Twelve weeks of supervised community resistance training improved lower-extremity muscle strength (11-26%) and fast gait speed (7%) versus controls, with improved frailty score and high adherence (about 90%); benefits occurred regardless of frailty status.
Effectiveness of a community-delivered pneumatic machine resistance training programme (Gym Tonic) for older adults at neighbourhood senior centres: a randomized controlled trial	Lee et al.	2021	Singapore	Randomized controlled trial	The 16-week low-intensity program was safe, feasible, and acceptable (attendance 81.3%); no overall between-group differences at 4 months, but adherent participants improved vital exhaustion ($d = 0.60$). Effects on physical performance were equivocal.
Effectiveness of community-based Baduanjin exercise intervention for older adults with varying frailty status: a randomized controlled trial	Tou et al.	2024	Singapore	Randomized controlled trial	Both periodized and non-periodized 6-month community exercise reduced age-related decline in gait parameters and functional fitness; gait parameters were sensitive to both protocols. A 24-week community exercise program produced small-to-moderate responsiveness in ankle plantar-flexion strength and power; the Calf-Raise Senior test detected functional change (minimal important difference 3.5 repetitions).
Effect of 6-month community-based exercise interventions on gait and functional fitness of an older population: a quasi-experimental study	Ramalho et al.	2018	Portugal	Quasi-experimental	A peer-led program produced significant improvements in Timed Up and Go and SF-36v2 physical, social, and emotional scores; gains were sustained and
Responsiveness of the Calf-Raise Senior test in community-dwelling older adults undergoing an exercise intervention program	André et al.	2020	Portugal	Single-group pre-post	
Outcomes of participation in a community-based physical activity program	Arnett et al.	2019	United States	Single-group longitudinal	

Title	Author(s)	Year	Country	Design	Key Findings
Examining the new-member effect to an established community-based physical activity program for older adults in England	Middleton et al.	2023	England	Non-randomized controlled	depended on age and attendance, with peer-led delivery comparable to professionally led programs. New members improved body mass, body mass index, 6-minute walk (+42.8 m), 30-second sit-to-stand, sit-and-reach, and arm-curl performance versus controls within 8 weeks, without regression on any measure.
Higher frailty levels are associated with increased improvement in health-related quality of life following a 12-week medical student-led walking program	Shivgulam et al.	2025	Canada	Single-group pre-post	A 12-week student-led walking program produced no overall change in health-related quality of life, but participants with higher baseline frailty showed the largest quality-of-life gains.
Effects of a 12-month supervised, community-based, multimodal exercise program followed by a 6-month research-to-practice transition on bone mineral density, trabecular microarchitecture, and physical function in older adults: a randomized controlled trial	Daly et al.	2020	Australia	Randomized controlled trial	The multicomponent program improved lumbar spine and femoral neck bone mineral density (1.0-1.1%), muscle strength (10-13%), and physical function (sit-to-stand 16%), with benefits persisting after transition; no significant effect on falls, and a per-protocol benefit on tibial trabecular bone.
Effects of activity tracker use with health professional support or telephone counseling on maintenance of physical activity and health outcomes in older adults: randomized controlled trial	Brickwood et al.	2021	Australia	Randomized controlled trial	Activity-tracker use with exercise-physiologist support or telephone counseling maintained daily step counts over 12 months, whereas usual care declined (about 981 fewer steps); trackers were as effective as telephone counseling for activity maintenance.
Short-term effects of a park-based group mobility program on increasing outdoor walking in older adults with difficulty walking outdoors: the Getting Older Adults Outdoors (GO-OUT) randomized controlled trial	Salbach et al.	2024	Canada	Randomized controlled trial	A park-based outdoor walk group was not superior to weekly reminders for outdoor walking minutes, but was superior for walking capacity, driven by improved walking self-efficacy.
A community-based exercise intervention to reduce functional risk factors for injury among stroke survivors in South Korea: a pilot randomized controlled trial	Kang et al.	2026	South Korea	Pilot randomized controlled trial	A supervised 8-week circuit-based program for community-dwelling stroke survivors showed high adherence and no adverse events, with exploratory improvements across multiple functional domains (strength, balance, mobility, cardiorespiratory fitness) versus control.

Table 5. Classification of the included studies by theme, design, intervention, and outcome

Author(s)	Year	Country	Research Design	Theme/Focus	Intervention Type	Primary Outcome(s)
Hongu et al.	2019	Japan	Single-group pre-post	Ambulatory activity promotion	Walking and stair climbing	Ambulatory steps; leg strength
Lee et al.	2021	Singapore	RCT (partial crossover)	Resistance training and muscle function	Pneumatic-machine resistance training	Muscle strength; gait speed; SPPB
Tou et al.	2024	Singapore	RCT (assessor-blind)	Low-intensity exercise and frailty	Baduanjin Qigong	Knee-extension strength; vital exhaustion; fear of falling

Author(s)	Year	Country	Research Design	Theme/Focus	Intervention Type	Primary Outcome(s)
Ramalho et al.	2018	Portugal	Quasi-experimental	Gait and functional fitness	Periodized multicomponent exercise	Gait parameters; functional fitness
André et al.	2020	Portugal	Single-group pre-post	Functional assessment sensitivity	Multicomponent community exercise	Ankle strength (Calf-Raise); chair stand
Arnett et al.	2019	United States	Single-group longitudinal	Mobility and fall-related outcomes	Balance and strength (peer-led)	Timed Up and Go; SF-36v2
Middleton et al.	2023	England	Non-randomized controlled	Fitness and psychosocial health	Group multicomponent exercise	6-minute walk; sit-to-stand; body composition
Shivgulam et al.	2025	Canada	Single-group pre-post	Quality of life and frailty	Walking plus education	Health-related quality of life; frailty
Daly et al.	2020	Australia	RCT	Musculoskeletal and bone health	Resistance, impact, and balance training	Bone mineral density; strength; physical function
Brickwood et al.	2021	Australia	RCT (3-arm)	Activity maintenance and technology	Activity tracker plus support	Daily steps; blood pressure; sit-to-stand
Salbach et al.	2024	Canada	RCT	Outdoor mobility and self-efficacy	Park-based outdoor walk group	Outdoor walking minutes; walking capacity
Kang et al.	2026	South Korea	Pilot RCT	Post-stroke functional risk reduction	Circuit-based multicomponent exercise	Strength; balance; mobility; cardiorespiratory fitness

The temporal distribution of the corpus indicates sustained scholarly attention over the review window, with a concentration of studies in the most recent years, consistent with growing policy interest in active aging. The annual distribution is shown in Figure 2.

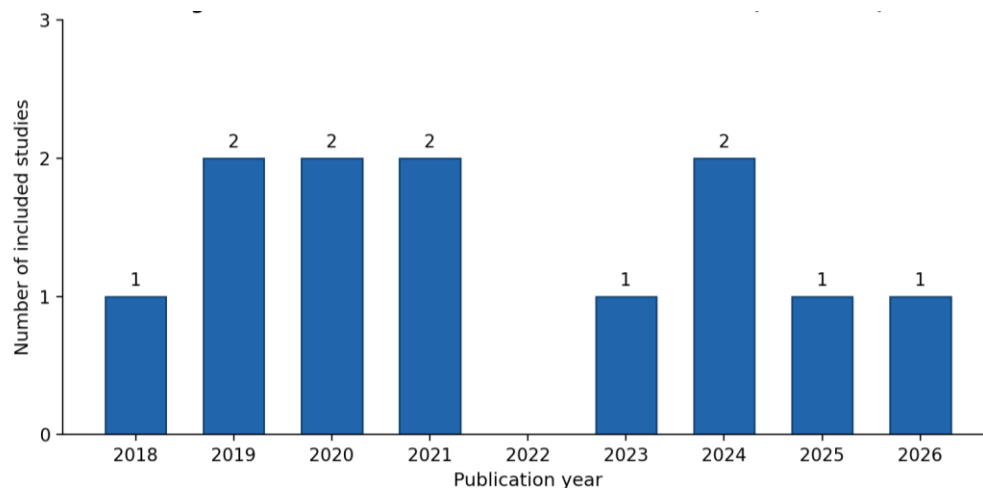


Figure 2. Annual distribution of the included studies (2018-2026)

Geographically, the evidence clustered in high-income countries, with Singapore, Portugal, Canada, and Australia each contributing two studies and the United States, Japan, England, and South Korea contributing one each. This distribution, summarized in Figure 3, signals a relative scarcity of controlled community-exercise evidence from low- and middle-income settings.

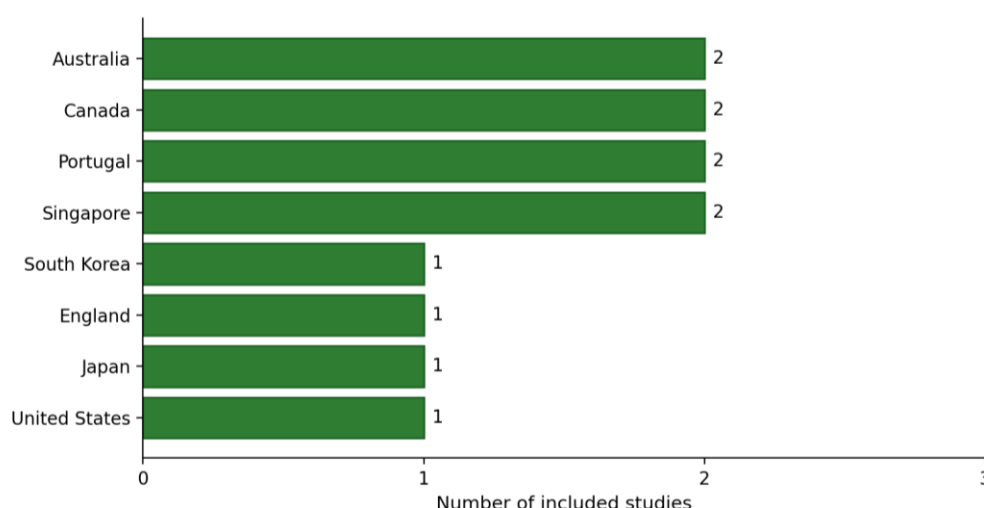


Figure 3. Geographic distribution of the included studies

Across the corpus, functional performance, gait and mobility, and muscle strength were the most frequently evaluated outcome domains, while bone health and cardiometabolic markers appeared less often. The distribution of outcome domains, which illustrates the field's emphasis on movement-related function over systemic health markers, is presented in Figure 4.

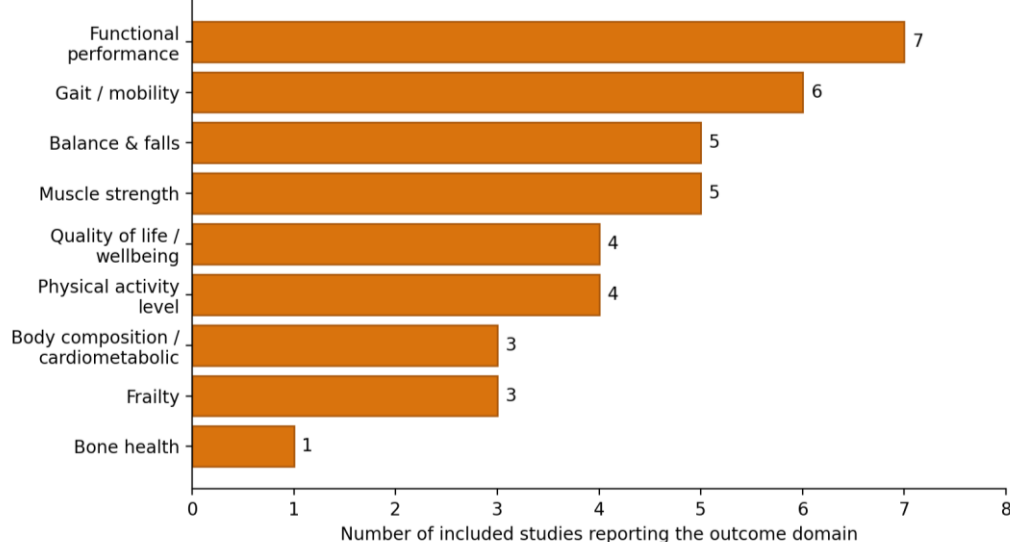


Figure 4. Distribution of outcome domains across the included studies

Thematic Synthesis for Research Question 1

The first research question concerned the effectiveness of community-based physical activity programs for improving physical function relative to usual care or control conditions. The strongest and most consistent evidence came from supervised, progressive programs with a resistance or multicomponent core. A large community-delivered resistance program produced clear gains in lower-extremity strength and fast gait speed against wait-list controls (Lee et al., 2021), and a 12-month multicomponent program improved muscle strength and multiple functional tests, including a 16% gain in sit-to-stand performance, with benefits persisting through a research-to-practice transition (Daly et al., 2020). Controlled comparison of new program members likewise showed rapid improvements in aerobic walking capacity and lower-body strength within eight weeks (Middleton et al., 2023). Single-group evaluations reinforced this pattern, with peer-led balance and strength programming improving Timed Up and Go and health-status scores (Arnett et al., 2019) and structured community exercise producing measurable change in ankle function (André et al., 2020).

Effectiveness was, however, conditional rather than uniform. Programs built around walking or low-intensity movement alone tended to yield smaller or non-significant between-group effects on function. A low-intensity Baduanjin program was safe and acceptable but produced equivocal physical-performance effects except among

highly adherent participants (Tou et al., 2024), and a park-based outdoor walk group did not outperform weekly reminders for outdoor walking, although it improved walking capacity through enhanced self-efficacy (Salbach et al., 2024). Comparative-design evidence indicated that different exercise protocols could attenuate functional decline to a similar degree, suggesting that the presence of a structured stimulus may matter more than its precise formulation (Ramalho et al., 2018). A consistent thread across studies was that adherence and attendance moderated benefit, with older and initially frailer participants gaining most when engagement was sustained (Arnett et al., 2019; Shivgulam et al., 2025). Taken together, community-based programs can improve physical function in older adults, but the magnitude depends on exercise intensity, progression, and adherence.

Thematic Synthesis for Research Question 2

The second research question addressed which program characteristics were associated with better health outcomes. Exercise type emerged as a primary determinant: resistance and multicomponent formats were linked to the most robust strength, functional, and musculoskeletal gains (Lee et al., 2021; Daly et al., 2020), whereas single-mode walking programs more often influenced activity behavior, self-efficacy, or quality of life than objective function (Salbach et al., 2024; Shivgulam et al., 2025). Frequency and duration also mattered, with twice-weekly supervised sessions sustained over three to twelve months associated with measurable adaptation (Lee et al., 2021; Daly et al., 2020), while briefer or lower-dose formats produced more limited change (Hongu et al., 2019). Delivery format and support structures shaped both engagement and maintenance; wearable technology combined with professional support preserved activity levels as effectively as telephone counseling and outperformed usual care over a full year (Brickwood et al., 2021).

Beyond the core exercise prescription, contextual and population characteristics conditioned outcomes. Baseline frailty acted as an effect modifier, with more frail participants deriving greater quality-of-life benefit from a modest walking program (Shivgulam et al., 2025) and adherent frail participants improving on select measures in a low-intensity program (Tou et al., 2024). Supervision and peer or professional leadership supported adherence and produced outcomes comparable to clinician-led delivery (Arnett et al., 2019), and community-dwelling participants with chronic conditions such as stroke tolerated multicomponent circuits safely with promising functional signals (Kang et al., 2026). The synthesis therefore indicates that better health outcomes are associated with progressive, adequately dosed, and supervised programs that are tailored to baseline capacity and supported for maintenance, rather than with any single exercise modality in isolation.

The magnitude of functional benefit, where reported, was clinically relevant rather than merely statistical. Lower-extremity strength improvements of roughly one tenth to one quarter and gait-speed gains near the threshold of perceptible change indicate that well-dosed community programs can shift older adults away from disability-associated performance bands (Lee et al., 2021; Daly et al., 2020). Improvements in composite mobility measures such as the Timed Up and Go and the sit-to-stand test are particularly meaningful because these tests predict independence and fall risk, and their responsiveness to community delivery suggests that specialized clinical environments are not a precondition for functional adaptation (Arnett et al., 2019; André et al., 2020). At the same time, the persistence of gains through a research-to-practice transition points to the feasibility of embedding effective programs within existing community infrastructure rather than time-limited research projects (Daly et al., 2020).

Comparative and Critical Analysis

Methodologically, the corpus was anchored by randomized controlled trials but relied substantially on quasi-experimental and single-group designs, which constrains causal inference for a portion of the evidence. Trials with comparison conditions and objective, performance-based outcomes, such as strength dynamometry, gait speed, and the short physical performance battery, provided the most defensible effectiveness estimates (Lee et al., 2021; Daly et al., 2020), whereas pre-post evaluations, though informative about feasibility and real-world reach, could not isolate the intervention from secular or expectancy effects (Hongu et al., 2019; André et al., 2020). Outcome heterogeneity further complicated comparison, as studies operationalized physical function through divergent instruments and reported effects on different scales, precluding quantitative pooling. A methodological evolution was nonetheless visible over time, with more recent studies incorporating accelerometry, self-efficacy constructs, and implementation metrics alongside traditional function tests (Brickwood et al., 2021; Salbach et al., 2024). Under-reporting of intervention fidelity and dosage in several reports limited replication, echoing broader concerns about fidelity documentation in community exercise research (Bird et al., 2020).

Setting and leadership further conditioned outcomes. Programs situated in neighbourhood senior centres, parks, and leisure facilities extended reach into everyday community life, and delivery by trained peers or exercise professionals sustained engagement without compromising benefit relative to clinician-led models (Lee et al., 2021; Arnett et al., 2019; Salbach et al., 2024). The safe participation of community-dwelling older adults

living with chronic conditions indicates that appropriately supervised community exercise can serve populations often excluded from generic programming, provided that progression is individualized (Kang et al., 2026; Tou et al., 2024). These observations reinforce that health outcomes reflect an interaction between the exercise prescription and the delivery ecosystem rather than the prescription alone.

Discussion

Interpreted as a whole, the evidence supports a dose- and design-dependent model of effectiveness in which community-based physical activity reliably benefits older adults when the stimulus is progressive, supervised, and sustained. The convergence of resistance and multicomponent programs on strength and functional gains aligns with the physiological premise that sufficient mechanical loading is required to counter sarcopenia and preserve mobility, and it clarifies why walking-only formats, while valuable for activity behavior and wellbeing, more rarely shift objective function (Salbach et al., 2024; Hongu et al., 2019). This reading is consistent with foundational evidence that functional capacity tracks physical activity across the aging trajectory (Tomas et al., 2017; de Souza-Lima et al., 2026).

Theoretically, the findings extend behavior-maintenance and self-efficacy frameworks by showing that psychological mechanisms, particularly walking self-efficacy, can improve even when behavioral volume does not, indicating partially dissociable pathways from program participation to outcome (Salbach et al., 2024). The role of baseline frailty as an effect modifier enriches the vulnerability-benefit perspective, suggesting that those with the greatest deficits may have the greatest capacity to gain when programs are appropriately calibrated (Shivgulam et al., 2025; Tou et al., 2024). Qualitative accounts of older adults' motivations and experiences help explain these patterns, situating adherence within social meaning and enjoyment rather than adherence to prescription alone (Bennett et al., 2018; Maula et al., 2019; Rosa et al., 2023).

Practically, the synthesis offers actionable guidance for practitioners, program designers, and policymakers. Community services aiming to protect physical function should prioritize progressive resistance or multicomponent training delivered at least twice weekly under competent supervision, whether professional or trained-peer, and should build in explicit maintenance supports such as home programs, wearables, or counseling (Lee et al., 2021; Daly et al., 2020; Brickwood et al., 2021). Attention to recruitment, scalability, and clinical-community linkage is equally important, given persistent barriers to reaching and retaining inactive older adults (O'Regan et al., 2020; Fishleder et al., 2018; Kelly et al., 2019; Bird et al., 2019). Program designers should also embed evidence-based balance and fall-prevention content, which surveys indicate is inconsistently present in existing community offerings (Sibley et al., 2019; Touchette et al., 2021; Bulow et al., 2026).

Situated against prior reviews, the present synthesis corroborates and sharpens earlier conclusions. A recent systematic review reported promising but heterogeneous quality-of-life benefits of community physical activity models for older adults (Qadrijati et al., 2026); the current review localizes that heterogeneity to differences in exercise type, dose, and adherence, and it distinguishes robust functional effects from more variable behavioral and wellbeing effects. Large program evaluations from varied contexts similarly attest to reach and psychosocial benefit (Sarmiento et al., 2017; Rubio et al., 2022; Wagner-Gutierrez et al., 2025; Chater et al., 2022), reinforcing that community delivery is a viable platform whose functional yield depends on program engineering.

Several contradictions in the literature merit attention. Whereas some trials reported clear between-group functional gains (Lee et al., 2021; Middleton et al., 2023), others found null primary effects despite good adherence and safety (Tou et al., 2024; Salbach et al., 2024), a divergence attributable to differences in exercise intensity, outcome sensitivity, and statistical power in pilot samples (Kang et al., 2026). Evidence on delivery format is also mixed, with group formats favored for social engagement yet solitary or flexible formats suiting some participants, and with sex differences complicating simple recommendations (Tomiooka et al., 2026; Bennett et al., 2018). These tensions caution against one-size-fits-all prescriptions.

Three research gaps are evident. First, controlled evidence from low- and middle-income countries is sparse, limiting the generalizability of predominantly high-income findings (Balis et al., 2019; Bockarie et al., 2025; Gonzalez et al., 2024). Second, outcome measurement is fragmented, with few studies harmonizing performance-based instruments or reporting falls with adequate power (Daly et al., 2020; Marconcin et al., 2025). Third, long-term maintenance and the resilience of programs to disruption remain under-studied, as illustrated by the functional losses observed when community programs closed during the pandemic (Bercovitch et al., 2025; Mellow et al., 2022).

This review has limitations. Reliance on a single primary database, though comprehensive and multidisciplinary, may have omitted eligible records indexed elsewhere, and restriction to English-language articles could introduce language bias. The heterogeneity of designs and outcomes precluded meta-analysis, so effectiveness is described narratively rather than quantified, and the inclusion of quasi-experimental and single-group studies, while appropriate for capturing real-world programs, tempers causal certainty. Finally, several

included reports under-described intervention fidelity and dosage, constraining the precision of the program-characteristic analysis (Bird et al., 2020).

A concrete future research agenda follows from these findings. Priority should be given to adequately powered randomized trials in under-represented regions that use a harmonized core outcome set for physical function and falls, enabling future meta-analysis (Marconcin et al., 2025; Zhou & Shi, 2026). Investigators should test scalable, technology-augmented maintenance strategies and directly compare exercise modalities and doses to isolate active ingredients (Brickwood et al., 2021; Moran et al., 2025). Implementation-focused studies should evaluate recruitment, fidelity, and clinical-community linkage as primary outcomes, and should examine how programs can be sustained and adapted through periods of disruption (Harden et al., 2021; Lowndes & Connelly, 2023; Regan et al., 2019).

In direct response to the research questions, the synthesis indicates for RQ1 that community-based physical activity programs can improve physical function among community-dwelling older adults relative to usual care, with the clearest benefits for muscle strength, gait speed, and functional performance arising from supervised, progressive resistance or multicomponent programs, and smaller or condition-dependent effects from low-intensity or walking-only formats. For RQ2, better health outcomes are associated with progressive resistance or multicomponent exercise, delivery at least twice weekly over several months, competent supervision, tailoring to baseline frailty, and structured maintenance support, rather than with any single modality considered alone.

Conclusions

This systematic review of 12 controlled and comparative studies shows that community-based physical activity programs can meaningfully improve physical function and related health outcomes among community-dwelling older adults, with the strongest and most consistent gains in strength, gait, and functional performance produced by supervised, progressive resistance and multicomponent programs, while walking-only and low-intensity formats yield smaller or frailty-dependent benefits moderated by adherence. The core contribution of the review is an integrated, design- and dose-sensitive account that distinguishes robust functional effects from more variable behavioral and wellbeing effects and translates this distinction into practical guidance for delivering effective, scalable community exercise services. The conclusions are tempered by reliance on a single database, English-language restriction, outcome heterogeneity that precluded meta-analysis, and uneven fidelity reporting. Future work should prioritize adequately powered trials in under-represented settings, harmonized outcome measures, and rigorous evaluation of maintenance and implementation to consolidate the evidence for active aging. These conclusions are grounded in specific numerical patterns across the 12 included studies. Lower-extremity strength improvements of 11–26% and gait-speed gains of 7% were documented in the highest-quality community resistance trial (Lee et al., 2021; $n = 302$; Low RoB), and 16% sit-to-stand and 1.0–1.1% bone mineral density gains were observed in a 12-month multicomponent RCT (Daly et al., 2020; $n = 162$; Low RoB) these constitute the quantitative benchmarks for the "strongest and most consistent gains" claim. By contrast, a walking-focused RCT found no between-group superiority for outdoor walking minutes despite good adherence (Salbach et al., 2024; $n = 106$; Low RoB). Single-database searching (Scopus) was a deliberate scoping decision given its comprehensive, multidisciplinary coverage; this limitation is explicitly acknowledged and supplementary searching of PubMed, CINAHL, and Cochrane CENTRAL is recommended for future reviews. Future adequately powered trials should target a minimum of $n = 80$ –120 participants per arm based on medium-to-large effect sizes (Cohen's $d \approx 0.5$ –0.8) observed in the included RCTs for strength and gait outcomes, adopt a harmonised core outcome set (grip strength + gait speed + Short Physical Performance Battery + falls at 12 months minimum), and extend follow-up to ≥ 12 months to assess maintenance of benefit.

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