Factors associated with gait efficacy in community-dwelling older adults: A scoping review

Review Article

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Factors associated with gait efficacy in community-dwelling older adults: A scoping review

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Abstract

Purpose: This scoping review maps the literature on factors associated with gait efficacy in community-dwelling older adults, considering its role as both a dependent and independent variable.

Methods: The review followed Arksey and O'Malley's five-stage methodological framework. Eligible studies focus on older adults, gait efficacy as the primary concept, and community settings. PubMed, EMBASE, CINAHL, and APA PsycArticles databases were searched through July 2024. Two reviewers independently applied the selection criteria and systematically extracted data, which were summarized.

Results: Fourteen articles met the inclusion criteria, comprising nine cross-sectional studies, three randomized controlled trials, one longitudinal study, and one Pretest-posttest study. The findings indicate significant associations between gait efficacy and age, musculoskeletal conditions (e.g. knee osteoarthritis, back and leg pain), physical function (e.g. walking ability, leg agility and walking endurance), and physical activity. Additionally, gait efficacy influences various health outcomes, including physical activity, mobility, physical function, functional limitations, fear of falling, and self-efficacy.

Conclusion: This is the first review to identify key factors associated with gait efficacy in older adults. Gait efficacy was associated with age, musculoskeletal conditions, physical function, and physical activity, which can be determinants of fall risk.

KEY WORDS

Gait efficacy, mobility, physical function, older adults, scoping review, self-efficacy

INTRODUCTION

Self-efficacy has become a global concern for community-dwelling older adults due to its significant impact on quality of life, health behaviors, and functional independence[1]. Defined as the belief in one's ability to perform specific tasks or manage challenges, self-efficacy influences older adults' engagement in activities of daily living (ADLs), health-promoting behaviors, and adaptation to age-related changes[2, 3]. According to Bandura[2], self-efficacy develops through mastery experiences, vicarious learning, verbal persuasion, and physiological states. Enhancing self-efficacy is a critical public health goal.

In the context of gait, self-efficacy determines whether older adults engage in physical activity or avoid it due to fear or perceived inability. Mobility limitations are a major concern for community-dwelling older adults[4]. Reduced mobility prevents participation in recreational and community activities, leading to social isolation, depression, and declining health[5]. It also decreases independence, quality of life, and increases morbidity. Notably, even older adults with

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adequate physical function may limit activity if they perceive their environment as unsafe or lack confidence in their walking abilities-referred to gait efficacy. Gait efficacy (GE), defined as an individual's confidence in walking safely across various environments, is a key psychological construct affecting mobility and physical activity in older adults.

GE provides complementary information as a self-reported measure alongside performance-based assessments such as gait speed and stride length[6, 7]. This subjective perception significantly influences an older adult's decision to engage in physical activities, including walking and exercise, directly impacting overall health and functionality[8]. Conversely, low GE may lead to activity restriction, contributing to physical decline and reduced mobility. Despite the recognized importance of GE, a comprehensive understanding of its measurement properties and potential refinement remains limited, underscoring the need for further exploration of existing tools[9].

Current research indicates that GE, as measured by the modified Gait Efficacy Scale (mGES) demonstrates strong reliability (Intraclass corelation coefficient=0.93) and internal consistency (Cronbach's α=0.94)[9, 10], making it a valid and dependable tool for assessing gait efficacy in community-dwelling older adults. However, while the mGES is reliable, understanding the specific factors influencing GE is essential to enhance its clinical applicability. The previous study also found that the mGES correlates with physical performance metrics such as gait speed (r=0.38-0.64) and fear of falling (r=0.54-0.88)[10], suggesting a strong interplay between physical function and psychological factors. Longitudinal data further indicate a decline of 7.38 mGES points over three years, predicting functional limitations[11]. This highlights GE as not only an indicator of current mobility but also a predictor of future physical decline. Evidence also suggests that GE is linked to increased fall risk in older adults. Identifying factors that influence GE can help recognize older adults at risk of functional decline, enabling earlier intervention and tailored care. Additionally, while fear of falling and self-efficacy are recognized mediators of GE[12, 13], their interaction with physical determinants (e.g., balance, strength) is poorly understood[13]. The mechanisms through which these psychological and physical factors interact to influence GE require further exploration.

The dual role of GE as both a dependent and independent variable in various studies highlights its importance for further exploration. Scoping review methodology is particularly suited for mapping the key concepts and identifying gaps in the current evidence base. However, review specifically addressing gait efficacy in community-dwelling older adults remains limited. Therefore, this review serves as a preliminary study to provide an overview of the factors influencing GE, which can guide the design of future studies and clinical interventions aimed at improving mobility and health outcomes in this population. This scoping review aims to examine the factors associated with GE in community-dwelling older adults. The findings may serve as a reference for clinicians to assess GE and develop targeted exercise programs to maintain and improve mobility in community-dwelling older adults.

METHODS

Study design

This scoping review followed Arksey and O'Malley's five-stage methodological framework: (1) identifying the research question, (2) identifying relevant studies, (3) selecting studies, (4) charting the data, and (5) collating, summarizing, and reporting the results[14]. Article selection adhered to the Preferred Reporting Items for Systematic Reviews and Meta-Analyses extension for Scoping Reviews (PRISMA-ScR)[15]. The scoping review protocol was registered in the Open Science Framework Registries (Project link: https://osf.io/w6hpj). Ethical approval was not needed for this review of existing literature.

1. Identifying the initial research questions

This scoping review explored the research question: "What factors are associated with GE in community-dwelling older adults, considering its role as both a dependent and an independent variable?"

2. Identifying relevant studies

The search was conducted in July 2024 using PubMed, EMBASE, CINAHL, and APA PsycArticles. Search terms included "gait", "efficacy", "self-efficacy", "walking", and "confidence". The eligibility criteria for the scoping review were based on the Population

Concept Context (PCC) model.

P (Population): Studies involving community-dwelling older adults or comparisons between older patients with community-dwelling older adults were included.

C (Concept): GE, defined as an individual's confidence in their ability to walk safely, was the focal point of this scoping review. Eligible study designs included cross-sectional, observational, experimental (randomized controlled trials [RCTs] and non-RCTs), longitudinal, and mixed-method studies. Only English-language articles published in International journals through July 2024 were included. Excluded literature types were reviews, protocols, dissertations, abstracts, proceedings, and developmental studies (e.g., validity-reliability test studies). Duplicate publications and studies without full-text availability were also excluded.

C (Context): Studies conducted in community-dwelling settings.

3. Study selection

One author (RN) initially retrieved articles from PubMed, EMBASE, CINAHL, and APA PsycArticles using the defined search strategy. The Cochrane Library was also checked to ensure that no systematic reviews related to gait efficacy in older adults had been previously published. However, no relevant reviews specifically addressing gait efficacy in this context were found. Search was limited to studies published through July 2024. Rayyan Software was used to manage records, eliminate duplicates, and store articles. Two reviewers (RN, and ARAH) independently screened article titles and abstracts for eligibility based on inclusion and exclusion criteria. Full texts of potentially relevant studies were then retrieved and independently assessed. Reasons for the exclusion at this stage were documented. Disagreements were resolved through discussion between the reviewers. Figure 1 illustrates the selection process, duplication elimination, titles and abstracts screening, and full-text review.

4. Charting the data

For studies meeting inclusion criteria, relevant

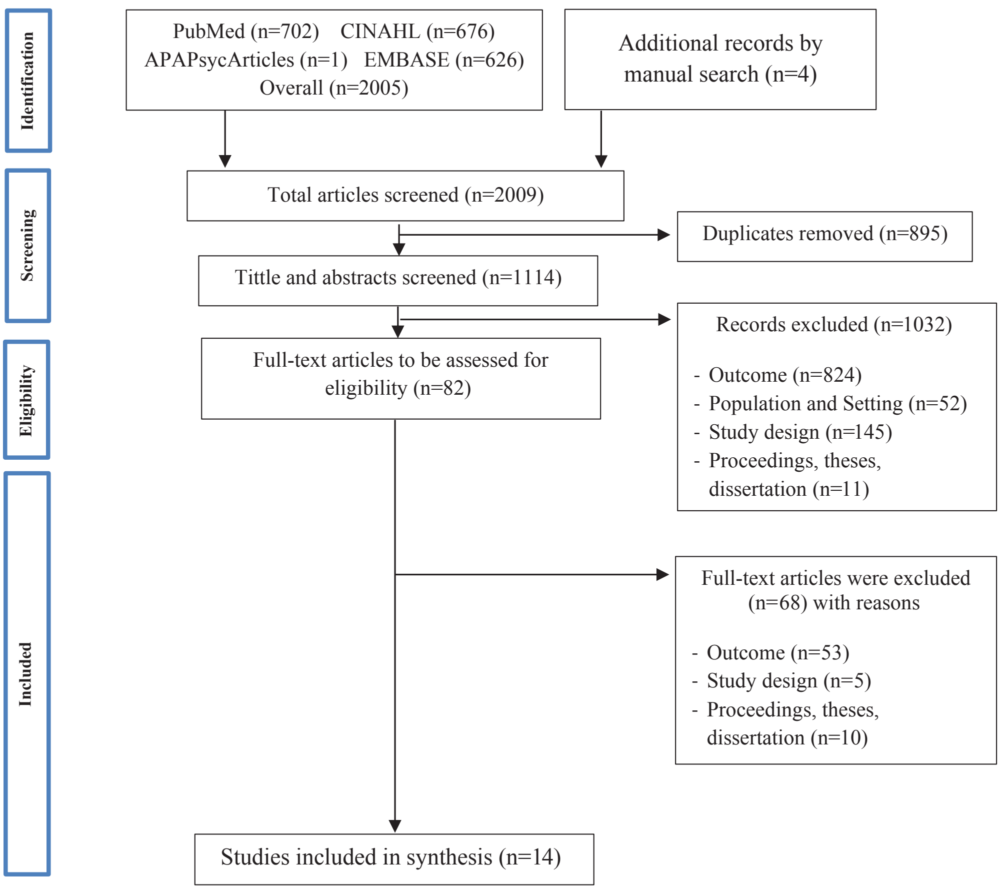

Figure 1. Study selection flowchart

information was extracted and recorded in a data charting form. The charting table included factors associated with GE.

5. Collating, summarizing, and reporting the results

Data were collated and analyzed thematically, focusing on factors influencing GE, their reported effects, research gaps, and recommendations for future research.

RESULTS

1. Study Characteristics

The characteristics of the 14 reviewed studies are summarized in Table 1. The selection process identified nine cross-sectional studies, three randomized controlled trials, one longitudinal study, and one pretest-posttest study. Studies were conducted between 1997 to 2023 and originated from diverse locations, including the United States (n=7)[16–22], Japan (n=3)[11, 23, 24], United Kingdom[25, 26] (n=2), China (n=1)[27], and Germany (n=1)[28]. The studies covered a wide age range (from 52 years and older), with sample sizes ranging from 13 to 5304 participants.

GE was assessed using the GE Scale (GES) in five studies[18–22] and the mGES in nine studies[11, 16, 17, 23–28]. The mGES is the most frequently used tool, measuring confidence in walking across different environments, such as a hardwood floor, grass, obstacle, curb, and stairs, with and without holding onto a railing, as well as long distances (e.g., 0.5 miles).

The GE scores varied across studies, with results reported using either mean standard deviation or median (interquartile range). Four studies reported GE as a dependent variable[11, 23, 25, 27], nine studies reported GE as an independent variable[16–22, 24, 28], and one study reported GE as baseline data without classification[26].

2. Factors Associated with Gait Efficacy in Community-Dwelling Older Adults

2.1. Gait efficacy as the dependent variable used in the study

Four of the 14 studies examined GE as the dependent variable (Table 2). These studies identified significant associations between age, musculoskeletal conditions (e.g., knee osteoarthritis [OA], back and leg pain), physical function (e.g., walking ability, leg agility, walking endurance), and physical activity with GE. However, sex and fall history showed no significant association with GE.

Age was negatively associated with GE, indicating that confidence in walking ability declines with age (β=-0.226, p=0.022)[23]. Knee OA and back-leg pain, particularly neurogenic claudication, were linked to lower GE (β=-0.474, p<0.001[23]; RR=3.11, 95% CI: 2.56-3.78[25]). Walking ability, as measured by tests such as the Time Up and Go (TUG), was positively correlated with GE (r=-0.254, p<0.01)[27]. Physical activity indirectly influenced GE through the mediation of walking ability (p=0.028)[27]. Leg agility and walking endurance predicted declining GE, with lower scores reflecting reduced walking confidence (p=0.027; p=0.049)[11]. However, female sex (p=0.197[11]; p=0.053[23]) and fall history (p=0.405)[11] were not significantly associated with gait efficacy.

2.2 Gait efficacy as the independent variable used in the study

Nine of the 14 studies examined GE as the independent variable (Table 3). GE was found to significantly impact multiple health domains, including health status, physical activity, mobility, physical function, fear of falling, and self-efficacy.

Health status

One study found that GE was negatively associated with chronic conditions, with older females with chronic diseases reporting lower GE (β=-0.32, p<0.05)[18].

Physical activity

Six studies examined the relationship between GE and physical activity. Four studies reported a positive association, while two found no significant correlation. More physically active older females demonstrated higher GE (β=0.44, p<0.01)[18], while higher GE was linked to increased step counts and reduced energy cost of walking in exercise-based programs[19, 28]. Higher GE was related to better performance in both single- and dual-task conditions. GE indirectly improved street-crossing performance, particularly in the dual-task conditions, through lower-extremity physical function[21]. However, two studies found no significant association

Table 1 Characteristics of study participants

Authors, years, country	Study design	Sample size (Range age)	GE measure	Score of GE	GE as the Dependent variable	GE as the independent variable
Okura K et al., 2022, Japan[23]	Cross-sectional	N=78 (≥65 years) Knee OA n=40 Female=34 Male=6 Control=38 Female=24 Male=14	mGES	Median (25^{th} and 75^{th} percentile) All 74 (40, 91) Knee OA 42 (30, 72) Control 88 (79, 100)	Yes	-
Chen X et al., 2022, China[27]	Cross-sectional	N=285 (>65 years)	mGES	NI	Yes	-
Dunlap P M et al., 2021, United State[16]	Cross-sectional	N=249 (>65 years) Female=163 Male=86	mGES	Mean (SD) 85.1 (13.6)	-	Yes
Suri A et al., 2021, United State[17]	Cross-sectional	N=232 (>65 years) Better gait=189 Poorer gait=43	mGES	Mean (SD) All 85.41 (13.36) Better gait 86.86 (12.58) Poorer gait 79.05 (14.93)	-	Yes
Williamson E et al., 2020, United Kingdom[25]	Cross-sectional	N=5304 (65-100 years) No back pain=2483 Back pain group Back pain only=1786 Back pain+Non-NC=441 Back pain+NC=594	mGES	Median (interquartile range) All 1 (1-3) No back pain 1 (1-1) Back pain group Back pain only 1 (1-3) Back pain+Non-NC 1 (1-6) Back pain+NC=5 (1-9)	Yes	-
Giannouli E et al., 2019, Germany[28]	Cross-sectional	N=70 (≥60 years)	mGES	Mean (SD) 89.2 (15.74)	-	Yes
McAuley E et al., 2006, United State[18]	Cross-sectional	Female N=249 (59-84 years)	GES	NI	-	Yes
Fujii K et al., 2020, Japan[24]	Cross-sectional	Female N=36 (≥65 years) Group 65-74 n=22 Group≥75 n=14	mGES	Mean (SD) 78.0 (19.3)	-	Yes
Mcauley E et al., 1997, United State[22]	Cross-sectional	N=58 (52-85 years) Female=45 Male=13	GES	Mean (SD) Low active 82.65 (16.34) High active 88.76 (14.58)	-	Yes
Gallagher N A et al., 2016, United State[20]	Pretest-posttest	Female N=13 (65-85 years)	GES	Mean (SD) 57.13 (30.31)	-	Yes
Williamson E et al., 2022, United Kingdom[26]	Randomized controlled trial	N=435 (≥65 years) BPA Group=143 BOOST Group=292	mGES	Mean (SD) Overall 5.6 (3.3) Best practice aduice Group 5.3 (3.3) BOOST Group 5.7 (3.3)	NI	NI
Ehlers D K et al., 2017, United State[21]	Randomized controlled trial	N=195 (60-79 years) Female=122 Male=73	GES	Mean (SD) 94.76 (10.38)	-	Yes
VanSwearingen J M et al., 2011, United State[19]	Randomized controlled trial	N=47 (NI) TO Group n=23 IO Group n=24	GES	Mean (SD) Pre 69.5 (20.2) Post 80.3 (13.9)	-	Yes
Sato Y et al., 2023, Japan[11]	Longitudinal study	N=85 (>60 years) Decline Group n=32 Keep Group n=53	mGES	Mean (SD) Baseline 83.2 (21.4) Follow-up 79.3 (21.8)	Yes	-

Notes: GE, Gait Efficacy; GES, Gait efficacy scale; NI, no information; OA, osteoarthritis; NC, neurogenic claudication
SD, standard deviation; BOOST, Better Outcomes for Older People with Spinal Trouble; TO, Task-oriented; IO, Impairment-oriented

Table 2 Gait efficacy as the dependent variable used in the study

Category	Independent variable	Outcome measures	Findings	Statistical details	Ref
Demographic	Age	Age	Older adults tend to have lower gait efficacy, suggesting that as individuals age, their confidence in walking safely may decline.	β=-0.226; SE=0.503 p=0.022	Okura K et al., 2022[23]
	Sex	Female sex	Female sex is not significantly associated with gait efficacy	β=-0.166; SE=5.544 p=0.053	Okura K et al., 2022[23]
		Sex	Sex is not significantly associated with gait efficacy decline	OR=2.300, 95% CI: 0.650-8.141 p=0.197	Sato Y et al., 2023[11]
Musculo-skeletal condition	Knee OA	Radiological Kellgren-Lawrence grade≥indicates knee OA	Older adults with knee OA exhibit lower gait efficacy compared to healthy community-dwelling older adults.	β=-0.474; SE=5.605 p<0.001	Okura K et al., 2022 [23]
	Back and leg pain	Questionnaire related to back pain & NC related symptoms	Older adults with back pain, particularly those with neurogenic claudication, demonstrate reduced gait efficacy.	RR=3.11 95% CI: 2.56-3.78	Williamson E et al., 2020[25]
Physical function	Walking ability	Time Up and Go Test	Gait efficacy is positively correlated with walking ability, indicating that greater gait efficacy is associated with better walking performance.	r=-0.254, p<0.01	Chen X et al., 2022[27]
	Leg agility	The open-close stepping test	Low agility, predicts a decline in gait efficacy.	OR=0.878 95% CI: 0.782-0.985 p=0.027	Sato Y et al., 2023[11]
	Walking endurance	The Shuttle Stamina Walk Test	Low walking endurance is a predictor of gait efficacy decline.	OR=0.974 95% CI: 0.949-1.000 p=0.049	Sato Y et al., 2023[11]
Physical activity	Physical activity (Subjective measure)	International Physical Activity Questionnaire	Gait efficacy may be indirectly associated with physical activity through the mediation of walking ability, enhancing walking confidence could improve walking performance and in turn, increase physical activity levels.	p=0.028	Chen X et al., 2022[27]
Fall history	Fall incidence	Questionnaire whether they had fallen in the past 12 month	Fall history was not significantly associated with gait efficacy	OR=1.839 95% CI: 0.438-7.727 p=0.405	Sato Y et al., 2023[11]

Notes: OA, osteoarthritis; NC, neurogenic claudication; OR, Odds ratio; CI, 95% confidence interval; SE, Standard error; RR, Relative risk

Table 3 Gait efficacy as the independent variable used in the study

Category	Dependent variable	Outcome measures	Findings	Statistical details	Ref
Health status	Health status	Chronic condition	Older females with more chronic conditions exhibit lower gait efficacy.	β=-0.32 p<0.05	McAuley E et al., 2006[18]
Physical activity	Physical activity (Subjective measure)	Physical Activity Scale for the Elderly and The Community Healthy Activities Model Program for Seniors	A significant relationship was observed between physical activity levels and gait efficacy, with more physically active older females demonstrating higher gait efficacy.	β=0.44 p<0.01	McAuley E et al., 2006[18]
	Physical activity (Subjective measure)	16 weeks walking program	Gait efficacy was not significantly associated with physical activity duration at any time point.	p>0.05	Gallagher N A et al., 2016[20]

Category	Dependent variable	Outcome measures	Findings	Statistical details	Ref
Physical activity	Physical activity (Subjective measure)	Exercise history	No significant association was found between gait efficacy and physical activity.	r=0.38 p=0.06	Mcauley E et al., 1997[22]
	Gait efficiency (Objective measure)	The energy cost of walking	A reduction in the energy cost of walking was observed following the TO intervention, leading to improvements in gait efficacy.	β=9.2; SE=3.7 p=0.02	VanSwearingen J M et al., 2011[19]
	Physical activity (Objective measure)	Steps	Higher gait efficacy was associated with taking more steps, suggesting that greater gait efficacy corresponds to higher physical activity levels and may serve as a predictor of real-life mobility.	β=0.310 p<0.05	Giannouli E et al., 2019[28]
	Street-crossing performance	A virtual street crossing task	Higher gait efficacy was linked to better performance in both single-task and dual-task conditions. Gait self-efficacy influenced street-crossing performance indirectly through lower-extremity physical function, particularly in the dual-task condition.	β=0.24 p=0.01	Ehlers D K et al., 2017[21]
	Exercise	Task-oriented sequence learning exercise (TO)	Confidence in walking improved significantly in the TO group, whereas no improvement in gait efficacy was observed in the IO group.	p=0.0065	VanSwearingen J M et al., 2011[19]
Mobility	Life space mobility	Life space assessment (LSA)	Gait efficacy demonstrated a positive association with the LSA total score, indicating that greater confidence in walking was significantly linked to increased life-space mobility.	r=0.217 p<0.001	Dunlap P M et al., 2021[16]
		Life space assessment (LSA)	Gait efficacy was associated with community mobility, suggesting that it may be a predictor of an older adult's ability to engage in community activities.	r=0.23 p<0.05	Suri A et al., 2021[17]
	Gait Quality	Step time Gait speed	Higher gait efficacy was linked to better gait quality, including faster gait speed, reduced step-time variability, and higher peak frequency amplitudes.	p<0.004	Suri A et al., 2021[17]
Physical function	Physical function performance	7-m gait speed 8-foot up and go test Stairs up-down	Older females with higher gait efficacy tended to perform better in physical function assessments.	β=-0.42 p<0.01	McAuley E et al., 2006[18]
	Lower extremity physical function	ascent/descent of a flight of 15 stairs the timed 8-foot Up and-Go test chair stands	Gait efficacy was positively associated with lower-extremity function.	β=-0.34 p=0.001	Ehlers D K et al., 2017[21]
	Waking abilities	Straight walking ability Curve walking ability	Scores on the modified Gait Efficacy Scale were significantly correlated with the results of both the 5-m and Figure-of-8 Walk Tests. The study suggested that high social functioning among community-dwelling older females helps maintain their confidence in walking	r=-0.64 p<0.01 r=-0.55 p<0.01	Fujii K et al., 2020[24]
	Balance	Berg balance scale	Highly active participants demonstrated significantly greater gait efficacy and better balance.	r=0.47 p<0.01	Mcauley E et al., 1997[22]
	Cardiorespiratory fitness (CRF)	Modified Balke-graded maximal exercise test	CRF was positively correlated with gait self-efficacy, with higher CRF levels associated with greater gait efficacy.	β=0.21 p=0.001	Ehlers D K et al., 2017[21]

Category	Dependent variable	Outcome measures	Findings	Statistical details	Ref
Physical function	Functional limitations	Late-life function and disability instrument	Gait efficacy had a significant direct effect on functional limitations with greater gait efficacy linked to fewer functional limitations.	β=0.33 p<0.01	McAuley E et al., 2006[18]
Fear of falling	Fear of falling	A 1-5 Likert scale indicates the degree afraid of falling	Highly active participants demonstrated significantly greater gait efficacy and reported less fear of falling.	r=-0.56 p<0.01	Mcauley E et al., 1997[22]
Self-efficacy	Exercise self-efficacy	Exercise self-efficacy scale	The correlation between exercise and gait self-efficacy was statistically significant.	β=0.31 p<0.01	McAuley E et al., 2006[18]

Notes: SE, standard error

between gait efficacy and physical activity duration[20, 22].

Mobility

Two studies examined mobility and found that GE was significantly correlated with life-space mobility[16, 17]. Higher GE was positively associated with the life-space assessment score, indicating greater walking confidence. In addition, higher GE was linked to better gait quality, including faster gait speed, reduced step-time variability, and higher peak frequency amplitudes (p<0.004)[17].

Physical function

Four studies consistently reported that GE was associated with better physical function, including improved overall performance (p<0.01)[18], lower-extremity physical function (p=0.001)[21], walking ability (p<0.01)[24], balance (p<0.01)[22], and cardiorespiratory fitness (CRF) (p=0.001)[21]. A study found a direct relationship between GE and fewer functional limitations (β=0.33, p<0.01), suggesting that improved GE reduces the impact of age-related physical decline[18].

Fear of falling and self-efficacy

A negative correlation between GE and fear of falling was consistently reported (r=-0.56, p<0.01), indicating that individuals with higher GE experience less fear of falling, which in turn promotes greater engagement in physical activities[22]. Another study reported a significant correlation between exercise self-efficacy and GE (β=0.31, p<0.01)[18], suggesting that confidence in both walking and exercise are interdependent, with improvements in one positively influencing the other.

DISCUSSION

This scoping review identifies factors associated with GE and its relationship with health outcomes in community-dwelling older adults. The results indicate that age, musculoskeletal conditions (e.g., knee OA, back and leg pain), physical function (e.g., walking ability, leg agility, walking endurance), and physical activity significantly correlate with GE. Additionally, GE may influence health status, physical activity, mobility, physical function, functional limitations, fear of falling, and self-efficacy among community-dwelling older adults.

1. Gait efficacy as the dependent variable used in the study

Age and musculoskeletal conditions are the primary factors influencing GE. Older adults generally exhibit lower GE, suggesting that confidence in their ability to walk safely declines with age[23]. However, no significant difference in GE was observed between young-old adults (65-74 years) and the old-old group (≥75 years)[24]. Other research suggests that while community-dwelling older adults with better physical function and activity levels maintain higher GE, chronic conditions such as back pain, knee OA, and leg pain substantially reduce GE. The findings highlight the need for targeted interventions to improve GE, particularly for individuals with chronic conditions[29].

Second, physical function and physical activity are also associated with GE. Older adults with poor physical function, including reduced walking ability, leg agility, and endurance, are at greater risk of GE decline. Diminished walking ability, often measured by the TUG test or gait speed assessments, reflects deficits in motor control, balance, and coordination, which can undermine walking confidence, particularly in challenging environments. Similarly, reduced leg agility, as measured by tasks such as the open-close stepping test, indicates impaired precision and speed movements[30]. Poor endurance limits sustained walking over extended distances or durations, reducing confidence in daily activities requiring prolonged mobility[31]. Moreover, GE may be indirectly associated with physical activity through the mediation of walking ability, suggesting that enhancing walking confidence could lead to improved performance and increased physical activity levels. Interventions aimed at improving agility, endurance, and walking ability may be essential to preserving GE decline and maintaining mobility independence in older adults.

A study by Sato et al.[11] found no significant association between fall history and GE. This may be attributed to factors. First, the study's logistic regression analysis emphasized performance-based factors such as mobility, agility, and walking endurance, which were more predictive of GE changes over time. Although fall history is an important determinant of overall mobility, it may not directly affect walking confidence unless accompanied by fear of falling or musculoskeletal impairments[32]. Additionally, participants had relatively good baseline physical function and activity levels, which may explain why fall history did not emerge as a strong predictor for GE decline.

Among the 14 studies included in this review, two studies found that female sex was not significantly associated with GE[11, 23], and three studies focused on older females as participants[18, 20, 24]. Okura et al.[23] highlighted that sex differences in GE might be influenced by the higher prevalence of musculoskeletal conditions, such as knee OA, in females. Furthermore, the effect of menopause on muscle mass and muscle strength in older females could potentially contribute to differences in gait efficacy[31]. Sex as a factor may need further exploration, as it may play a significant role in the lower GE observed in older females, particularly when considering the decline in physical function associated with menopause.

2. Gait efficacy as the independent variable used in the study

Our review found mixed findings regarding the association between GE and physical activity. Four of six studies reported a significant relationship, while two found no association. Physically active older adults with greater confidence in their physical abilities tend to demonstrate improved performance, leading to fewer limitations in daily tasks involving the lower body, underscoring the role of self-efficacy[33]. Variations in assessment tools may contribute to these inconsistencies. Some studies rely on self-reported measures, while others use objective tools such as step counts. These discrepancies highlight the need for further research using standardized methods to clarify the relationship between GE and physical activity.

GE was also identified as a predictor of life-space mobility, which refers to the extent to which older adults move within their communities and engage in daily activities[16]. Higher GE was associated with better life-space mobility, emphasizing its role in enabling social and physical engagement. Improving GE may help reduce social isolation and enhance mental health by promoting mobility and community participation. Additionally, higher GE correlated with better physical function, including improved gait speed, balance, and task performance[21]. For example, older adults with higher GE performed better on mobility tests such as the TUG and gait speed assessments, suggesting that GE directly impacts physical function and fall prevention. These findings underscore the importance of GE in maintaining functional independence and reducing fall risk.

Notably, CRF was positively correlated with GE[21], with higher CRF levels linked to greater confidence in walking. Improved CRF enhances endurance and stamina, allowing individuals to walk longer distances with less fatigue[34], thereby fostering a positive feedback loop. Enhancing physical fitness through improved CRF provides physiological and psychological benefits that collectively increase confidence in walking, ultimately supporting GE.

Conversely, fear of falling was inversely correlated with GE, with individuals who had higher GE reporting lower fear levels[22, 35]. This underscores the role of gait confidence in mitigating fear, which can hinder mobility and physical activity[35]. Similarly, exercise self-efficacy interacted with GE to influence mobility, as studies found that higher exercise self-efficacy was associated with greater GE[18]. Confidence in performing exercise may enhance confidence in walking, ultimately promoting mobility.

Finally, GE was linked to functional limitations, with higher GE associated with fewer physical restrictions. This suggests that individuals with greater confidence in their walking ability experience better physical function and fewer mobility-related limitations[18]. From a social-cognitive perspective, self-efficacy and physical activity share a reciprocal relationship. GE may directly influence functional limitations or exert an indirect effect through its impact on physical performance[8]. Higher self-efficacy fosters motivation, perseverance, and engagement in activities, ultimately reducing perceived functional limitations.

3. Implications for Older Adults, Future Research, and Healthcare Providers

The findings of this review highlight GE as both a predictor and an outcome of various health factors in older adults. Enhancing GE through targeted interventions, such as exercise programs and confidence-building activities, can improve mobility, physical activity, and overall independence. Additionally, addressing GE may help reduce the fear of falling, thereby improving quality of life and minimizing social isolation.

For healthcare providers, these findings suggest that interventions should not only focus on physical function but also address psychological aspects, particularly self-efficacy and GE. Providers should integrate self-efficacy training into rehabilitation programs and fall prevention programs to optimize outcomes for older adults. Furthermore, additional research is needed to explore the interaction between GE and environmental factors, such as the built environment, which may further influence an older adult's confidence and ability to walk.

4. Limitation

While this scoping review provides valuable insights into the role of GE in older adults' mobility, several limitations should be acknowledged. We acknowledge that the included studies used varying age ranges to define older adults. Most studies included were primarily cross-sectional, limiting the ability to establish causal relationships between GE and mobility outcomes. Additionally, the populations studied varied significantly in health conditions and socioeconomic factors. Some studies focused on individuals with specific conditions (e.g., arthritis, back pain), while others included broader samples of community-dwelling older adults. This variability may contribute to inconsistencies in findings, making it difficult to generalize results across all older adults. Future research should examine more homogeneous groups to better understand the relationship between GE and mobility in specific subpopulations. Lastly, most studies included in this review were conducted in Western populations, with limited representation from Asia or Africa. This lack of diversity restricts the generalizability of the findings, as cultural differences in aging, mobility, and healthcare access influence the relevance of the results. Future research should incorporate more cross-cultural studies to enhance the external validity of findings.

CONCLUSION

This scoping review identifies several factors associated with GE and examines its relationship with health outcomes in community-dwelling older adults. This scoping review identifies several factors associated with GE and examines its relationship with health outcomes in community-dwelling older adults. The findings suggest that age, musculoskeletal conditions (e.g., knee OA, back, and leg pain), physical function, and physical activity significantly influence GE. Specifically, one study reported that GE was associated with age, two studies found that musculoskeletal conditions were linked to lower GE, and two studies highlighted the association between physical function and GE. Additionally, one study demonstrated that GE is associated with physical activity.

The review also found that GE is associated with various health outcomes. One study showed that health status, particularly chronic conditions, negatively impacted GE, with lower GE observed in older adults with chronic conditions. Six studies indicated that increased physical activity improves GE, while two studies reported that higher mobility is associated with higher GE. Moreover, four studies found that better physical function was associated with better GE. Finally, one study highlighted that a reduced fear of falling and better self-efficacy were positively correlated with GE. These findings highlight its potential as a fall risk predictor, since GE was associated with age, musculoskeletal conditions, physical function, and physical activity, which can be determinants of fall risk.

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CONFLICT OF INTEREST STATEMENT

The authors declare that there is no conflict of interest.

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地域高齢者の歩行自己効力感の関連要因：スコーピングレビュー

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要　旨

目的：このスコープレビューでは，従属変数と独立変数の両方を考慮しながら，地域在住高齢者の歩行自己効力感に関わる要因に関する文献をマッピングした。
方法：このレビューは，Arksey と O'Malley の 5 段階の方法論的枠組みに従って実施された。対象となる研究は，高齢者，歩行自己効力感を主要概念とするコミュニティ環境に焦点を当てた。PubMed，EMBASE，CINAHL，および APA PsycArticles データベースを用いて 2024 年 7 月まで検索した。2 人のレビュー担当者が独立して選択基準を適用し，データを体系的に抽出しまとめた。
結果：14 編の論文が選定基準を満たし，9 編の横断研究，3 編のランダム化比較試験，1 編の縦断研究，および 1 編の事前事後テスト研究で構成された。結果は，歩行自己効力感と年齢，筋骨格系の状態（膝関節炎，背中，脚の痛みなど），身体機能（歩行能力，脚の敏捷性，歩行持久力など），および身体活動との間に有意な関連性があることを示した。さらに，歩行自己効力感は，身体活動，移動性，身体機能，機能的制限，転倒恐怖感，および自己効力感などに影響を及ぼしていた。
結論：本研究は高齢者の歩行自己効力感に関連する主要なリスクを特定した初めてのレビューであり，歩行自己効力感は転倒リスクの要因である年齢，筋骨格状態，身体機能，身体活動と関連していることから，転倒リスクにつながる可能性が明らかとなった。