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Healthy Steps Forward: A Systematic Review On Public Health Nurses Promoting Physical Activity Through Recreation Centres

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Abstract

Background: Physical inactivity among older adults poses a significant risk to public health, contributing to chronic illnesses and reduced quality of life. Public health nurses (PHNs), with their expertise in community engagement and preventive care, are well-positioned to lead physical activity (PA) interventions, particularly through community recreation centers. This study aimed to systematically review the evidence on the role and effectiveness of public health nurses in promoting physical activity among older adults through interventions delivered via community recreation centers.
Methods: A systematic review was conducted using PRISMA guidelines. Databases including PubMed, Embase, Scopus, Web of Science, Cochrane Library, CINAHL, and PsycINFO were searched for studies published between January 2010 and January 2025. Eligible studies involved older adults (≥60 years), public health nurse-led PA interventions in community recreation settings, and reported PA-related outcomes. Twenty-five studies met inclusion criteria, ranging from pilot trials to randomized controlled trials.
Results: PHNs led both direct and supportive interventions such as structured exercise programs, motivational interviewing, digital coaching, and behavioral counseling. Across most studies, interventions improved PA levels (e.g., step counts), blood pressure, BMI, functional mobility, quality of life, and self-efficacy. Nurse-led programs showed high acceptability, feasibility, and low adverse event rates. Technological tools (e.g., wearable trackers, web-based platforms) enhanced scalability but showed mixed acceptability among older users.
Conclusion: PHNs play a pivotal role in promoting physical activity among older adults through tailored, accessible, and community-based approaches. Their interventions demonstrate improved health outcomes and engagement, highlighting their importance in public health strategies targeting aging populations.

Keywords
Aging population; Physical inactivity; Older adults; Physical activity promotion; Fall prevention.

Introduction

The demographic situation in the world is shifting considerably. Life expectancy increases with an unprecedented rate and the number of elderly people in the population is also on the increase (Tcymbal et al., 2022). The number of individuals 65 years or more is 727 million as estimated in 2020. It has

also been estimated that come 2050, this figure will increase more than twice; to above 1.5 billion According to the latest 2020 data released by UN, there is also an aging population in the world (World Population Ageing 2020: Highlights, 2021). This population trend is accompanied by other social, and economic changes. They are the falling fertility rates, a shift in marriage and cohabitation trends as well as increasing educational levels in the younger populations ("World Population Ageing 2020: Highlights," 2021). Physical inactivity is a significant issue in the population of aging individuals. It considerably impacts personal well-being and sustainability of health care systems. A combination of such demographic and behavioral trends is a challenge and a potential prospect of societies of different countries across the globe (Marzo et al., 2023).

According to a World Health Organization projection, by 2050, the world population of adults aged 60 years and above will go up to 2 billion, which is four times higher than the current figure of 600 million in 2000 (Shiraishi et al., 2022). This is projected to increase to 1.6 billion by the year 2050. Others such as Japan, Singapore, among others, forecast that this would constitute more than 40 percent of their total populace (Keohane et al., 2018). The population in the developed nations is usually aging with a decline in the number of working age population. This may have a bad impact on economic growth, and social support systems (World Economic Forum, 2025). Moreover, people live longer and the age-related health problems increase. These are neurodegenerative diseases, cardiovascular diseases, and musculoskeletal diseases. They impose great loads on the healthcare systems and diminish the quality of life of older adults (Moeteke, 2022).

In old age, it is also imperative that disease prevention, treatment, and rehabilitation facilities should be accessed fairly at all stages of life. That is why integrated care is necessary so that old people could support themselves, living in familiar surroundings. ("World Population Ageing 2020: Highlights," 2021). It is important that we appreciate how the older people can help families, the communities as well as in the society. This is particularly so when one talks about the case of skip-generation households where both the elderly women would tend to be the main caregivers of the grandchildren. It is a case that necessitates alterations in the policy so that elderly people can have an easy time as they often pay with duties in the limited resources that they have to take care of their relatives. They may assist them in having higher risks of poverty in the future ("World Population Ageing 2020: Highlights," 2021).

It is worth to consider also the influence of social environment on health. Such issues as income inequality, social exclusion, and access to the vital services are influential factors in well-being and social participation. As population of older persons increases, it is important to combat physical inactivity because it has close association with chronic diseases and mortality rates in general (King & King, 2010). Consequently, the community-based interventions are required to promote healthy aging. Such approaches allow one to propose individualized aid and cover individual prerogatives and demands of older adults (Fulmer et al., 2021; Kalache & Sen, 2017). These programs, as well as others may assist elderly people in being independent, becoming physically and mentally healthy, and engaging in community activities, which would give them a sense of belonging and value. Community-based initiatives are able to access more individuals even those who may lack access to conventional health places. They can also achieve it through utilizing the available social networks, community facilities, and recreation facilities (Kalache & Sen, 2017).

Benefits of Physical Activity for Older Adults

Exercise has been famously shown to increase mental and physical health among the older age group (Palmer, 2020). Increasing physical activity should help to decrease the chances of getting non-communicable diseases and minimize healthcare expenses. It is also able to increase both life and aging satisfaction (MorenoAgostino et al., 2020). A healthy aging comes with great benefits of regular exercise. It reduces the risk of all-cause mortality, chronic illnesses and premature mortality (Mora & Valencia, 2017). Physical activity is extremely important to ensure that the body remains healthy and that its functions are normal at all stages of life (Bangsbo et al., 2019). Exercise interventions have given good outcomes recovering falls, pain, muscle loss, osteoporosis, and cognitive changes (Eckstrom et al., 2020). Moreover, regular exercising can enhance the cognitive performance and the mental well-being, enhancing the general quality of life (Thornton et al., 2025). Physiological, psychological and social benefits of physical activity among older adults occur so when they maintain a consistent physical activity (JUMARANG et al., 2025).

The physiologic ones are the enhanced cardiovascular health (Ang et al., 2022), blistered muscle force and endurance, the enhanced bone density, and the diminished risk of any fall. The psychological ones

entail a boosted mood, reduced stress, anxiety, augmented cognitive performance, and enhanced self-esteem. The social benefits concern a more possibility of a social contact, reduction of social isolation, and improved community engagement (Rajpoot & Sharma, 2025). Research about exercise in adults is also scarce, especially in the elderly, since the overall life expectancy increases (Parnicka, 2018). Seniors have higher chances of falling and getting injured due to the decrease in physical fitness and becoming inactive. Exercise is crucial in preventing falls that are the leading cause of disability and injuries among older adults (Thornton et al., 2025). Physical, cognitive, and mental aspects covered by exercise-based programs could be considered a promising way to develop muscle strength, balance improvement, and cognitive abilities, including attention and space comprehension (Zhong et al., 2024). One of the modifiable aspects of lifeways that can have a considerable impact on its decline during old age is regular physical activity (Klimoa, & Dostalova, 2020).

Exercise reduces the chances of such long-term diseases as cardiovascular disease, type 2 diabetes, and certain cancers. Such states create a large healthcare burden in society and reduce living standards. Physical activity interventions have indicated a good improvement on fall risks and associated traumas in older adults (Gerards et al., 2017; Pereira et al., 2008). All it takes is a structured program which encompasses your order balance and strength exercises as they can greatly reduce the risk of falls. It proves the necessity ofactic exercise in older adults who are at burdensome risk of falling (Greenwood-Hickman et al., 2015). Nevertheless, there is inconclusive evidence pertaining to exercise and the prevention of falls, other than balance training (Unsworth & Mode, 2003). Research has indicated that these physical shortcomes can be kept at bay using exercise programs that engulfs sufficient doses of moderate- to high-balance challenges (Jefferis et al., 2015). These programs have shown to be used successfully to reduce falls in the community-dwelling elderly people. They are to focus on strengthening and balancing exercises during more than 3 hours per week (Martins et al., 2018).

Such a multiple-risk-factor approach that involves balance factor, level of physical activity, interventions to alleviate fear of falling, and medication oversights will reduce fall risks of the elderly population to a large extent (Larson & Bergmann, 2008). The latter will require cooperation between medical practitioners and therapists (Martins et al., 2018). The study is successful because balance and strength in older adults could be improved with structured exercise programs, e.g., the Otago Exercise Program (Martins et al., 2018). A special focus should be on the balance training based on perturbations which directly trains the processes of recovery required to avoid falls (Gerards et al., 2017; Martin, 2011; Park & Chang, 2016). Whereas potentially significant, the brain mechanisms of how Otago Exercise Program can avert falls remain unclear (Yang et al., 2022).

Barriers and Facilitators to Physical Activity Participation

Old age is one of the barriers to routine exercise. These are mobility problems, fear of getting harm, social isolation, access to appropriate facilities and persistent ill health. These barriers may have a significant impact on their capacity to live an active life (Stanforth et al., 2015). The obstacles are either physical, mental or social, and they tend to interact intricately to have an effect on the level of activities (Secretariat, 2008). Aged persons are also afraid of falls and coping with physical disabilities due to chronic diseases. These issues minimize their exercising capacity. Most elderly citizens have mobility problems and it is difficult to have frequent physical exercises. Such problems can be arthritis, pain in the joints and balance (Shubert, 2011). The fear of falling is a possible obstruction as well. It may result in a decrease in physical activity engagement and additional deteriorations in physical health (Hamm et al., 2016; Gerards et al., 2017).

We require solutions to individual needs and different requirements in order to overcome them. It comprises available training regimes, secure space as well as social frameworks. Another big problem is motivation as not every older adult is going to be excited by the daily activities that involve balance and strength. Older patients may also feel lonely and socially unsupported, therefore, becoming less likely to engage in activities that require a community or a group. Depression, anxiety and fear of falling are psychological factors, which may drastically decrease the level of physical activities in elderly people (Deshpande et al., 2008; Zhang et al., 2019). Good facilitators of physical activity are favorable environments, organized programs, access to transportation, social support and positive attitudes to exercise. Supportive environments include environments that provide safe and available locations to exercise such as parks, walking trails, and community centers. Furthermore, well-organized programs that address the exact needs and needs of older people may enhance motivation and compliance (Cress et al., 2005).

Access to transportation may assist older adults to conquer geographical issues and get engaged in physical activities. In order to boost initiation and continuity of physical activity routine, social support networks including friends, family members, and healthcare providers have pivotal roles to play. These networks provide much needed emotional support as well as practical help and belonging that can greatly boost the adherence of a person to the active lifestyle (Johnson et al., 2007). The elderly people would be more active in their lives with a positive perception about exercises and its numerous health risks. Engagement of the older ones of nursing homes may be motivated through encouragement, guidance, and feedback to remain active (Chen & Li, 2014). Appreciative attitudes towards the exercise are important; aged people who appreciate the power of exercise will exercise regularly.

Public Health Nurses as Key Facilitators

The involvement of public health nurses in enhancing physical activities in older adults using health education, motivation, and program facilitating strategies is significant. They are well prepared to assist the older persons since they are exposed to vast degrees of experiences in health education, preventive health, and community health (Goodman et al., 2011). Nurses can provide individual conversation to help seniors overturn obstacles and maintain exercise programs, support goal creating, and some techniques to deal with problems. They are also in a position to determine the physical and functional capacity of older adults in order to develop exercise programs according to their needs and individual weaknesses. Trying to form environments that would motivate older adults to become more active, nurses collaborate with the local organizations, senior centers, and healthcare providers. They are able to build and create the community-based program that would attract the physical activity and provide it with the greater accessibility (Hickerson et al., 2008). Nurses are important in training the older adults on the physical exercise benefits to the health, which can include cardiovascular, cognitive and musculoskeletal health. They also exchange safe and effective exercise strategies (Bakhshi et al., 2015). They also may clarify on available resources and programs in the community, as well as suggestions on how to overcome barriers to physical activity in the community.

Effectiveness of tailored interventions in promoting physical activity

Individually-based or tailored interventions are highly effective in the promotion of physical activity among elders. They focus on individual obstacles and make the most out of engagement (Cunningham & O Sullivan, 2021). Interventions that take into consideration fitness level, health of an individual and what he or she likes stands a better chance of motivating change over a certain period of time. To increase the impact of these interventions, they may be modified to take into consideration a number of factors such as cultural background, socioeconomic status and health literacy. Nurses are able to perform comprehensive assessments to know about specific needs and issues of every patient and develop particular exercise programs that would be safe and effective. They are able to assist older persons by offering real life guidelines and facilitation on how to live through the challenges like transport complications, absence of companionship or insecurity. Generalization of the intervention through clear targeting of the specific needs and interest of every individual is not only effective in enhancing initial contact but also facilitates continuous adherence to the treatment thereby maximizing the perspective of long-term pursuit of a physically active lifestyle (Stewart, 2001).

The self-care activities that can alleviate the fatigue and avoid burnout include regular physical work, sufficient sleep, good nutrition, and free time (JUMARANG et al., 2025). This requires a team system of delivering programs that would give comprehensive and differentiated treatments that address the needs of older adults. Together with physiotherapists, nurses will be able to come up with personalized exercises regimens which better solve certain musculoskeletal complaints or impaired mobility. Trainers in fitness can impart the information regarding conducting the fitness or their modes of doing it, and the program coordinators can help in arranging of programs, and any other arrangements, and any affairs of the resources in the program. Another way to promote physical activity is through education of older adults of its benefits, including cardiovascular health improvements and cognitive improvements (Zaleski et al., 2016).

Table 1: Key themes, interventions, and outcomes in promoting physical activity among older adults.

Theme	Purpose/Problem	Intervention/Approach	Outcome/Impact	References
Aging Population Trends	Rising proportion of adults 65+ leading to healthcare burden	Demographic tracking & global policy planning	Need for age-sensitive interventions and economic adjustment	Tcymbal et al., 2022; World Population Ageing, 2021; Keohane et al., 2018
Physical Inactivity Risk	Sedentary behavior increases chronic illness and mortality in older adults	Emphasis on prevention and health promotion	Increased demand on health services if unaddressed	King & King, 2010; Moreno-Agostino et al., 2020
Health Benefits of Physical Activity	Reduce NCDs, improve mental and musculoskeletal health	Moderate–vigorous regular exercise	Decreased mortality, falls, improved QOL and independence	Mora & Valencia, 2017; Eckstrom et al., 2020; Rajpoot & Sharma, 2025
Fall Prevention through Exercise	Falls are a leading cause of injury and hospitalization in seniors	Otago program, strength and balance training	Reduced fall risk, improved postural stability	Martins et al., 2018; Gerards et al., 2017; Jefferis et al., 2015
Barriers to Activity	Fear of injury, isolation, chronic disease, facility access	Identify individualized needs and environmental redesign	Higher engagement with personalized support	Shubert, 2011; Hamm et al., 2016; Zhang et al., 2019
Facilitators of Activity	Need for motivation, support, safe spaces	Social support, group exercise, transportation aid	Improved adherence and health outcomes	Cress et al., 2005; Johnson et al., 2007; Chen & Li, 2014
Role of Nurses	Older adults need guidance for lifestyle adoption	Education, counselling, collaboration with community	Increased participation and behavioral change	Bakhshi et al., 2015; Goodman et al., 2011
Tailored Programs	Generic interventions lack adherence	Culturally and medically personalized exercise plans	Greater long-term adoption and satisfaction	Stewart, 2001; Cunningham & O'Sullivan, 2021
Digital Tools & Telehealth	Mobility/access challenges limit program reach	Wearables, apps, remote coaching	Real-time monitoring and support improve outcomes	Ghanvatkar et al., 2018; Villa-García et al., 2023
Nurses in the Digital Future	Digital shift in health delivery demands new skills	Training in telehealth, data tools, digital literacy	Efficient, personalized care with technology integration	Booth et al., 2021; Livesay et al., 2023; Isidori et al., 2022

To offer the full care and assistance, communication and collaboration of members is crucial. Healthcare providers play an important role in enforcing compliance with the treatment guidelines, particularly to treat a chronic condition and to medicate by polypharmacy. The interdisciplinary team must be equipped in accordance with the needs of older adults (Fairhall et al., 2011; Uchmanowicz et al., 2018). With joint coordination, healthcare providers can ensure adequate support and assistance to older individuals. This is useful in terms of both first-time participation and eventual adherence to physical activity programs, and this can raise the possibility of improved health and an enhanced quality of life. It is possible to integrate physical activity in the clinical practice and nurses can implement it with the assistance of wearable technology. This strategy opposes the increase in the sedentary lifespan problems

(Carter & Ford, 2023). They should inform medical workers about the practices of encouraging physical activity and teach them about the most current practices (Bakhshi et al., 2015).

Understanding physical and functional capabilities helps nurses to create individualized exercise programs according to the needs and restrictions of each patient (Hell-Cromwijk et al., 2021). They collaborate with community groups, elderly centers and health services to create an environment that makes the old more active. The community-based interventions are tasks that nurses could develop and apply, to encourage and support physical activity. Individually designed interventions which take into account the condition of a person, his level of fitness, and the type of preferences are more likely to achieve success in the effort to achieve stable behavioral changes. Adjustment of these interventions could be done against many factors including cultural backgrounds, socioeconomic status, and health literacy among others in a bid to ensure maximum efficiency. On their part, nurses may perform thorough assessment to identify the individual needs and problems of every patient, so that they may design safe and effective individualized exercise plans. Such interventions are personalized to the needs and desires of a particular person, which makes first contact more active and helps maintain a long-term active lifestyle more organic and probable. The nurses can help the patients overcome the barriers to physical activity, such as by introducing exercise into their daily plans and monitoring their progress (Forster et al., 2020).

Technology plays an important role in promotion of physical activity among older adults. It offers tracking, evaluation, and encourage features that enhance participation and compliance with routines (Haan et al., 2021). Fitness trackers, health-related apps installed on smartphones, and telehealth applications provide seniors with an opportunity to easily observe their activity rates, track their own objectives, and improve in real-time (Ghanvatsarkar et al., 2018). The technology can be properly incorporated into the working process of nurses whose skill is to evaluate the level of individual comfort and familiarity with technologies and modify the intervention accordingly. App-based smartphone apps and wearables have been used to teach, track, or encourage physical activities (Rossen et al., 2020).

Nurses have the ability to educate older adults on the usefulness of the use of technology to achieve their exercise targets and assist them on how to utilize these instruments efficiently. Telehealth services can also offer them a way of providing remote exercise programs, virtual coaching, and checking on the progress of patients that they have not been physically available to check up on. The strategy can address the barriers such as transportation problems or limitation of mobility (Villa-García et al., 2023). The wearable has displayed potential on the enhancing activity and health of adults and the aged among patients with chronic diseases (Jasmin et al., 2021). Also, nurses are able to offer social support and peer relationships to older adults by building online groups or virtual exercise teams where they can communicate with each other and provide inspiration or share experience (Lindeman, 2017).

The role of nurses as health promotion agents in communities is very vital (Flaubert et al., 2021). Nurses can help people gain control of their health outcomes by educating them, developing outreach, and advocating in their behalf to solve health-related matters. They may also successfully incorporate interventions based on the use of technology into practice by keeping informed about the recent changes in digital health, attending professional training, and working with interdisciplinary teams in order to deliver comprehensive care. In conclusion, although technology is promising in terms of getting the older adults to be physically active, its usage still has to be planned, taught, and assisted by healthcare professionals to last into old age. New opportunities on the border of nursing practice and digital technologies arise as the discipline drastically changes because of the exponential growth of digital technologies and the necessity to address complex global health challenges (Booth et al., 2021). Nurses are able to prevent illness and injury, advance health and preserve the health of the community and population. Nursing is getting more frequent in the introduction of telehealth, remote monitoring equipment, predictive analytics, and AI-driven chatbots. These literacy tools provide opportunities to nurses to give more effective, individualized, and accessible care (Logsdon, 2022).

Nursing profession should concentrate their efforts on building the leadership competency, investing in the technology resources, and improving the digital literacy of the nurses in order to prosper in this digital future (Booth et al., 2021). The implementation and evaluation of digital health technologies should include nurses so that they can practice them correctly and provide high-quality and safe care (Livesay et al., 2023). In addition to technical competence, nurses need to enhance a set of soft skills, communication tactics, and managerial capabilities to pass through the telemedicine practice effectively and remain in a good relationship with patients (Isidori et al., 2022). The training programs that can be

used to enhance the digital competence of the nurses are important tools that can be used to enable nurses to practice the digital health technologies in the day-to-day processes (Kulju et al., 2024). Also, nursing leaders should advocate policies that will promote equitable and ethical application of technology in health care. This makes the digital solutions preserve patient autonomy, privacy, and access to care (Isidori et al., 2022; Tsarfati & Cojocaru, 2023).

MATERIALS AND METHODS

Review design:
This systematic review's PECOS protocol (Population, Exposure, Comparison, Outcomes, Study design) followed the reporting guidelines of PRISMA so that it can be made transparent and reproducible.

Table 2: Inclusion and exclusion criteria devised for this review.

Criteria	Inclusion	Exclusion
Population	Older adults aged 60 years and above, living independently in the community	Studies focusing on institutionalized older adults or populations below 60 years of age.
Exposure	Interventions involving public health nurses (PHNs) leading, facilitating, or supporting physical activity programs delivered through community recreation centers.	Interventions not involving public health nurses or those conducted outside community recreation centers, such as hospital-based or home-based programs
Comparator	Usual care, no intervention, or other non-nurse-led physical activity programs.	Studies lacking a comparison or baseline measurement.
Outcomes	Studies reporting on physical activity levels such as steps per day and exercise frequency, health outcomes such as blood pressure, mobility, and quality of life, or program adherence	Studies that do not report physical activity outcomes or relevant health-related indicators.
Study design	Pilot studies, quasi-experimental studies, pre-post intervention studies, or randomized controlled trials	Case reports, opinion pieces, protocols, conference abstracts, or purely qualitative studies without outcome assessment.
Publication language	English only.	Non-English publications.
Publication year	Studies published from Jan 2010 to Jan 2025.	Studies published more than 15 years ago.

Database search protocol
To ensure an all-inclusive capture of literature, a database search strategy was conceptualized. The databases searched include PubMed, Embase, Scopus, Web of Science, Cochrane Library, CINAHL, and PsycINFO. The precision of the search was maximized using Boolean operators and MeSH keywords. It included combinations such as:
("Public Health Nurse" OR "Community Health Nurse" OR "PHN") AND
("Physical Activity" OR exercise OR "fitness program" OR "walking program") AND
("Older Adults" OR elderly OR "aging population" OR seniors) AND
("Community Recreation Center" OR "community center" OR "recreational facility") AND
("Pilot Study" OR "feasibility study" OR "intervention study")
Data extraction protocol and data items
A form of pre-designed extraction of the data was used to do the extraction of the data. There was a two-independent-reviewer data extraction that minimized error and bias. Study characteristics such as the author, the year, where the study was conducted, the study design, study sample size and

demographics, intervention details (What role were public health nurses playing, what physical activity were they promoting, how was it delivered, how often, and what setting was it done in (study conducted in community recreation centers)), outcomes in the changes in physical activity levels, health indicators (blood pressure, BMI, quality of life), program adherence, and participant satisfaction, the statistical outputs that included mean differences, confidence intervals, p-values, and effect sizes such as odds ratios Third, reviewers compared and settled inconsistency by checking in consensus.

RESULTS

The database search retrieved an initial total of 807 records from five databases: Google Scholar (n = 352), PubMed (n = 152), Web of Science (n = 204), PsycINFO (n = 43), and CINAHL (n = 56). After the removal of 296 duplicate records, 511 unique records remained for screening. No records were excluded during the initial screening stage. All 511 records were sought for retrieval, of which 242 could not be retrieved. The remaining 269 reports were assessed for eligibility. Among these, 244 were excluded for various reasons: not being community-based (n = 89), lacking the involvement of public health nurses (n = 69), or not reporting relevant physical activity outcomes (n = 86). Ultimately, 25 studies were included in the final systematic review.

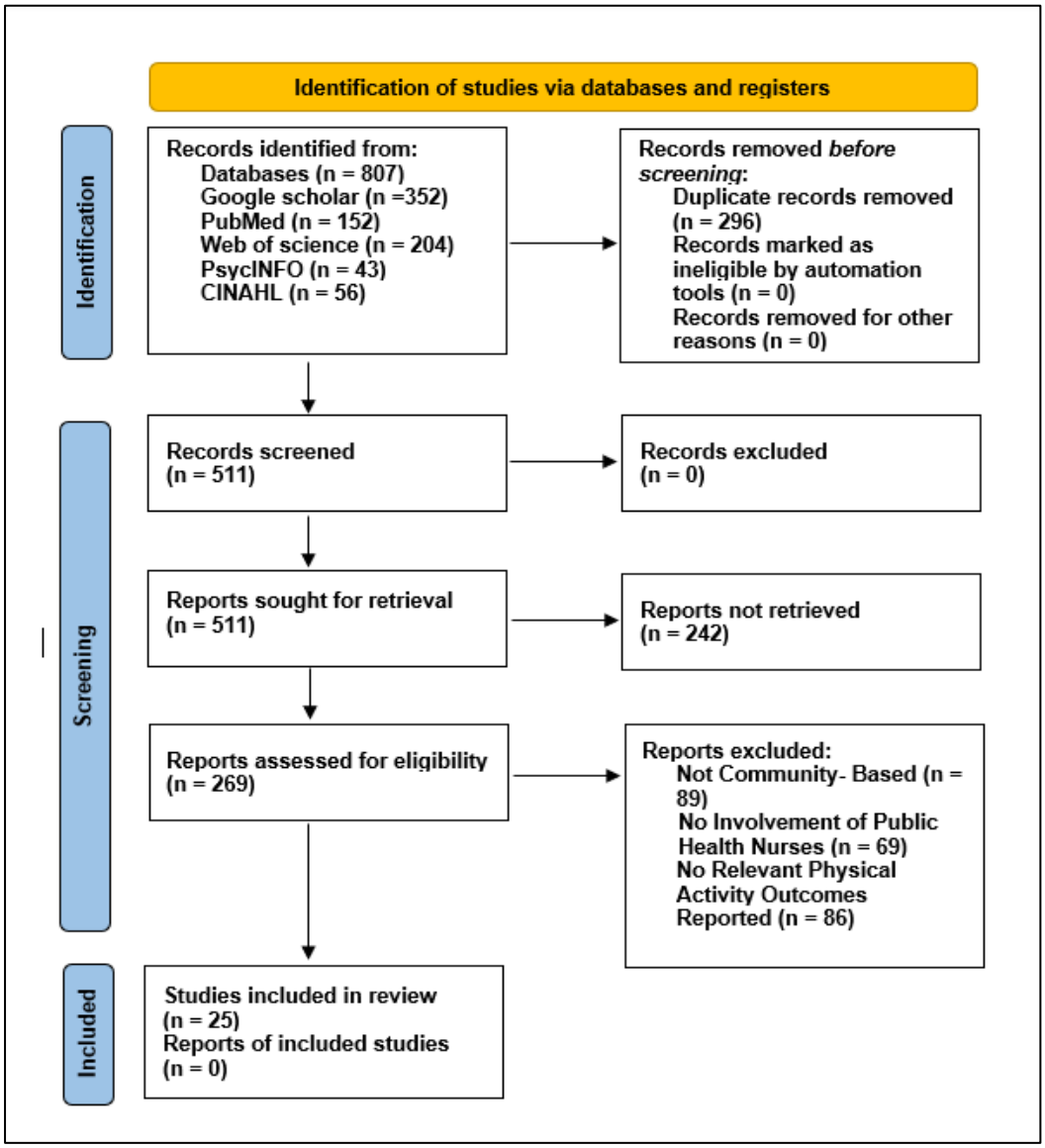

Figure 1: PRISMA flowchart

The role of the public health nurses was multifaceted that was addressed in a number of studies either directly facilitating PA (e.g. direct facilitation of PA through leading an exercise session or a walking program), or indirectly by providing behaviour change assistance through motivational interviewing, goal setting, provision of feedback, or the utilisation of digital and telephonic media. Different theoretical models of behavioural change (e.g., Transtheoretical Model, RE-AIM, goal-setting theory) were also used in other studies (e.g, Chudowolska-Kieplkowska & Malk (2020), S o n me z S a ri & Keti sm (2024), Benedetti et al. (2020)), leading to beneficial changes in the everyday PA levels, self-efficacy, and cardiometabolic markers in many cases.

Almost every intervention showed at least moderate impact on the PA engagement improvement. The one outcome which was most often reported was step count, whereas other improvements in blood pressure, BMI, health-related quality of life (HRQoL), motivation, as well as cognitive or functional health were also observed in some studies. Markedly, Duru et al. (2010) demonstrated a mean of almost 10 000 more steps/week and a decrease in systolic blood pressure (SBP) of 12.5 mmHg and Matz-Costa et al. (2018) presented an 11 percent more steps that were sustained at 8 weeks. Interventions that featured digital health innovations (e.g., virtual nurse avatars, wearables, or web-based coaching) including those authored by Bickmore et al. (2013), Zhang et al. (2020) and Irvine et al. (2013) were found to be feasible with good behavioural effects over time, and others complained of poor acceptability of technologies by older adults.

Wallace et al. (2014), Frable et al. (2025), and Lavoie & Dub p (2025) piloted studies with recruitment rates of above an unprecedented percentage have already shown high rates of attendance, good participant engagement, and rare bad events, implying that nurse-led interventions are highly accepted, safe. In addition, hybrid implementations (providing studies on methods of peer mentoring or faith-related settings or community volunteer assistance; e.g., Rich et al., 2017, Anderson & Pullen, 2013) emphasized the scalability of nurse-led PA promotion and contextual flexibility. Studies of longer effects (>6 months) including those of Thom et al. (2021) and Rich et al. (2017) disclosed the possibility of long-term benefits (improvements) in PA, dietary choices, and cardiovascular well-being. The challenges to implementation were resource-intensity and staff burden, however, in some environments (e.g., Benedetti et al., 2020). The covered studies were all in North and South America, Europe, and Asia, which highlights the universality of the use of public health nursing in PA promotion. Specific cultural adaptations (e.g., by faith, e.g., Anderson & Pullen, 2013) or local fusion (e.g., with the local community health literacy, e.g., Uemura et al., 2018) seemed to increase the uptake and performance of the interventions.

Table 3: An overview of nurse-led community-based physical activity interventions for older adults, highlighting study design, settings, interventions, and outcomes.

Author (Year)	Country	Study Design	Setting & Population	Intervention (Role of Nurse)	Duration	Outcomes Measured	Main Findings
Frable et al. (2025)	USA	Mixed Methods Pilot Study	Older adults in community rec centers (D4H)	Nurse-led dance, PA monitoring, feedback, Table Talks	8 weeks	Attendance, enjoyment, HR, feasibility	High attendance and enjoyment; feasible and no adverse events
Chudowolska-Kiełkowska & Małek (2020)	Poland	RCT	199 sedentary older adults with CV risk	The intervention involved nurse-led goal setting, the use of	3 months	Steps, BP, BMI, glucose	Steps and CV markers improved significantly

				a pedometer, and supportive phone calls			
Sönmez Sari & Kitiş (2024)	Turkey	RCT	117 older adults	Nurse-led motivational interviewing (TTM)	24 weeks	Stage of change, PA score, steps	70.4% reached action stage; improved PA and self-efficacy
Lavoie & Dubé (2025)	Canada	Mixed Methods Pilot	30 older adults' post-surgery	Web-based nurse-led support with personalized feedback	7 weeks	PA, QoL, motivation, feasibility	Positive engagement; full results pending
Wallace et al. (2014)	UK	Quasi-experimental	Older adults aged 60 years and above	Nurse-supported 12-week community exercise	12 months	Fitness, QoL, social isolation	Fitness gains sustained; reduced isolation
Saçıkara & Cingil (2024)	Turkey	RCT	66 community-dwelling elderly	Nurse-led home visits with group walking, mobile app guidance, and reminder messages	4 weeks	Healthy lifestyle behaviours	Improved PA and health scores; strong effect size
Uemura et al. (2018)	Japan	RCT	84 rural older adults	Nurse-led active learning focused on physical activity and health literacy	24 weeks	HL, PA, memory, diet	Increased steps, HL, balance, and cognitive scores
Chan et al. (2016)	Taiwan	Pilot Test	20 community care	Nurse-developed elastic	1 month	Functional fitness,	Improved flexibility, muscle

			station elders	band exercise program		sleep, self-rated health	strength, and perceived health
Turk et al. (2016)	USA	Pre-post	118 seniors in 6 centers	Nurse-facilitated group promoting physical activity and nutrition	12 weeks	Steps, walking pace, self-rated health	Functional mobility and PA improved significantly
Mutrie et al. (2012)	UK	Pilot RCT	Adults aged 65 and above in a primary care setting	Nurse-led walking consultations combined with pedometer use	12 weeks intervention followed by a follow-up period	Steps, QoL, sedentary behaviour	Sustained step count and QoL increase
Petrescu-Prahova et al. (2019)	USA	Cluster RCT Protocol	YMCA centres	Nurse-linked referral from PT clinics to community PA (EF program)	Ongoing	EF enrolment, implementation cost	Strengthens clinic-community linkage potential
Benedetti et al. (2020)	Brazil	RCT	114 older adults from public health centres	Nurse-supported behaviour changes or traditional exercise	12 weeks	PA, QoL, RE-AIM elements	Behaviour change group had greater gains; staff burden noted
Anderson & Pullen (2013)	USA	Cluster RCT	27 African American older women in faith communities	Nurse-led PA with spiritual strategies	12 weeks	Strength, walk distance, barriers	Significant PA improvement and reduced barriers
Thom et al. (2021)	UK	Pilot RCT	75 older adults in Age Well Center	Nurse-facilitated goal-setting behaviour change	12 months	PA, diet, CV health	Increased PA and diet quality; sustained improvements
Rich et al. (2017)	USA	Hybrid Type II Trial	408 seniors in 12 centers	Peer-led PA with nurse training	18–24 months	PA intensity, BP, QoL,	Peer strategy enhanced long-term

				and monitoring (PEP4PA)		implementation	PA adherence
Bickmore et al. (2013)	USA	RCT	Clinics; 263 older adults	Virtual nurse coach avatar (ECA)	12 months	Daily step count	Short-term gains in steps
Frosch et al. (2010)	USA	Quasi-experimental	2 senior centers	Nurse-led video sessions with group physical activity discussions	12 weeks	Activation, PA, SF-12	PA and activation improved
Muramatsu et al. (2018)	USA	Pilot	Medicaid home care	Nurse-trained aides promote daily PA	4 months	Function, fear, pain	Improved function & high acceptability
Werner et al. (2014)	USA	Pre-post	432 elders in 2 cities	Nurse-trained peer-led exercise	20 weeks	Fitness, health, BMI	Improved fitness and health satisfaction
Matz-Costa et al. (2018)	USA	Pilot RCT	Community	Nurse-led physical activity goal setting with peer mentoring	8 weeks	Steps, engagement	Step count increased by 11 percent and was maintained at 8 weeks
Duru et al. (2010)	USA	RCT	Church-based setting with 62 women aged 60 and above	Nurse-delivered faith-based PA and support	6 months	Steps/week, BP	Steps increase 9883/week; SBP decrease 12.5 mmHg
Zhang et al. (2020)	USA	Pilot	Retirement community	Nurse-facilitated PA + wearable trackers	8 weeks	Fidelity, feasibility	High adherence, low tech favourability
Chia et al. (2023)	Taiwan	Quasi-experimental	Community; 120 older adults	Monitored walking via smart bracelets	8 weeks	Steps, health behaviour	Strong correlation to lifestyle change

Irvine et al. (2013)	USA	RCT	Online; 368 older adults	Nurse-designed web intervention	12 weeks	14 PA and health outcomes	Large gains; sustained at 6 months
Di Pumpo et al. (2024)	Multi-country	Systematic Review	Community-based adults aged 60 and above	DHIs incl. nurse-supported eHealth tools	3–18 weeks	Steps, PA, sedentary time	Motivational reminders most effective

Assessment of bias

For studies evaluated using the ROBINS-I tool (Figure 2), several studies exhibited high overall risk of bias. Specifically, Wallace et al. (2014), Turk et al. (2016), and Frosch et al. (2010) had critical overall bias, primarily due to concerns in domains related to confounding (D1), deviations from intended interventions (D4), and measurement of outcomes (D6). Frable et al. (2025) and Lavoie & Dubé (2025) had moderate bias in domain 1 and domain 4, with no serious risks in other domains, resulting in moderate overall bias. Conversely, studies such as Werner et al. (2014), Zhang et al. (2020), and Chia et al. (2023) demonstrated low overall bias, with consistently low risk across most domains. Petrescu-Prahova et al. (2019) and Muramatsu et al. (2018) also showed low to moderate bias, suggesting generally sound methodological quality.

In contrast, studies evaluated using the RoB 2.0 tool (Figure 3) displayed mostly low overall risk of bias. Nearly all studies, including Chudowolska-Kiełkowska & Małek (2020), Sönmez Sari & Kitiş (2024), Saçıkara & Cingil (2024), and Thom et al. (2021), had consistently low risk across all domains. A few studies, such as Mutrie et al. (2012), Anderson & Pullen (2013), and Benedetti et al. (2020), showed some concerns primarily in domain 1 (randomization) and domain 5 (selection of the reported result), yet still maintained an overall low risk of bias. This pattern suggests that the majority of studies assessed with RoB 2.0 employed rigorous randomization and reporting practices, resulting in higher methodological confidence.

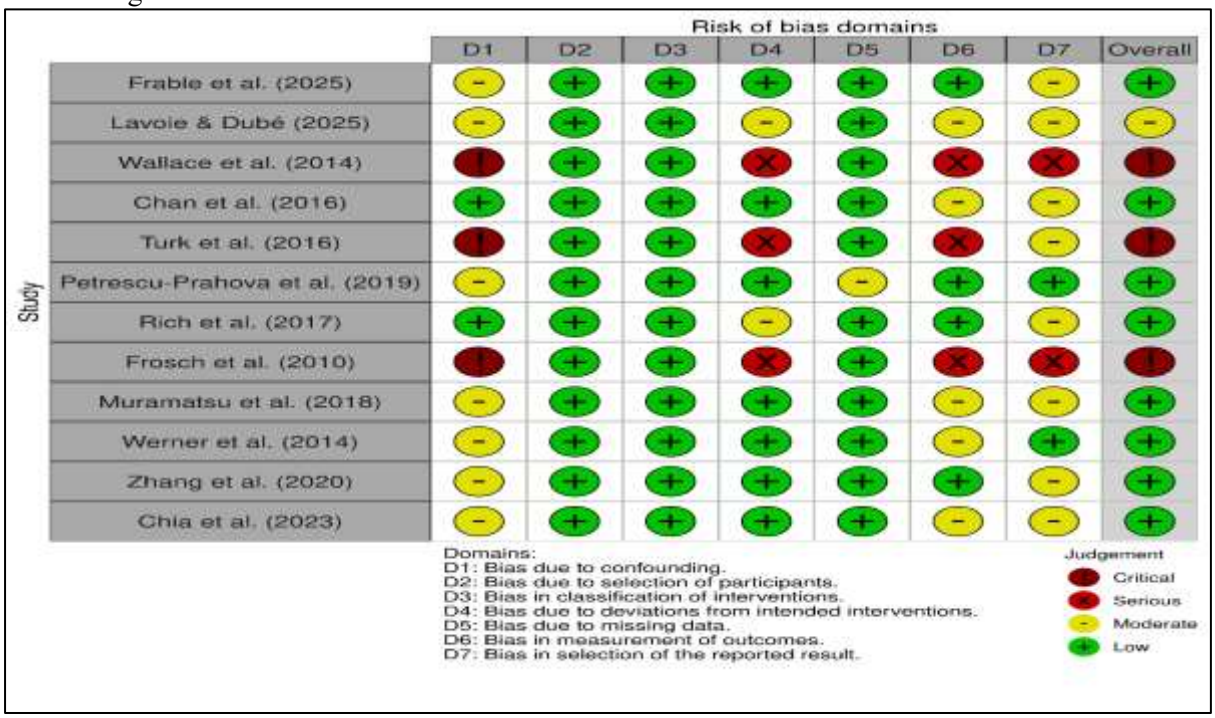

Figure 2: Bias assessment using the ROBINS-I tool.

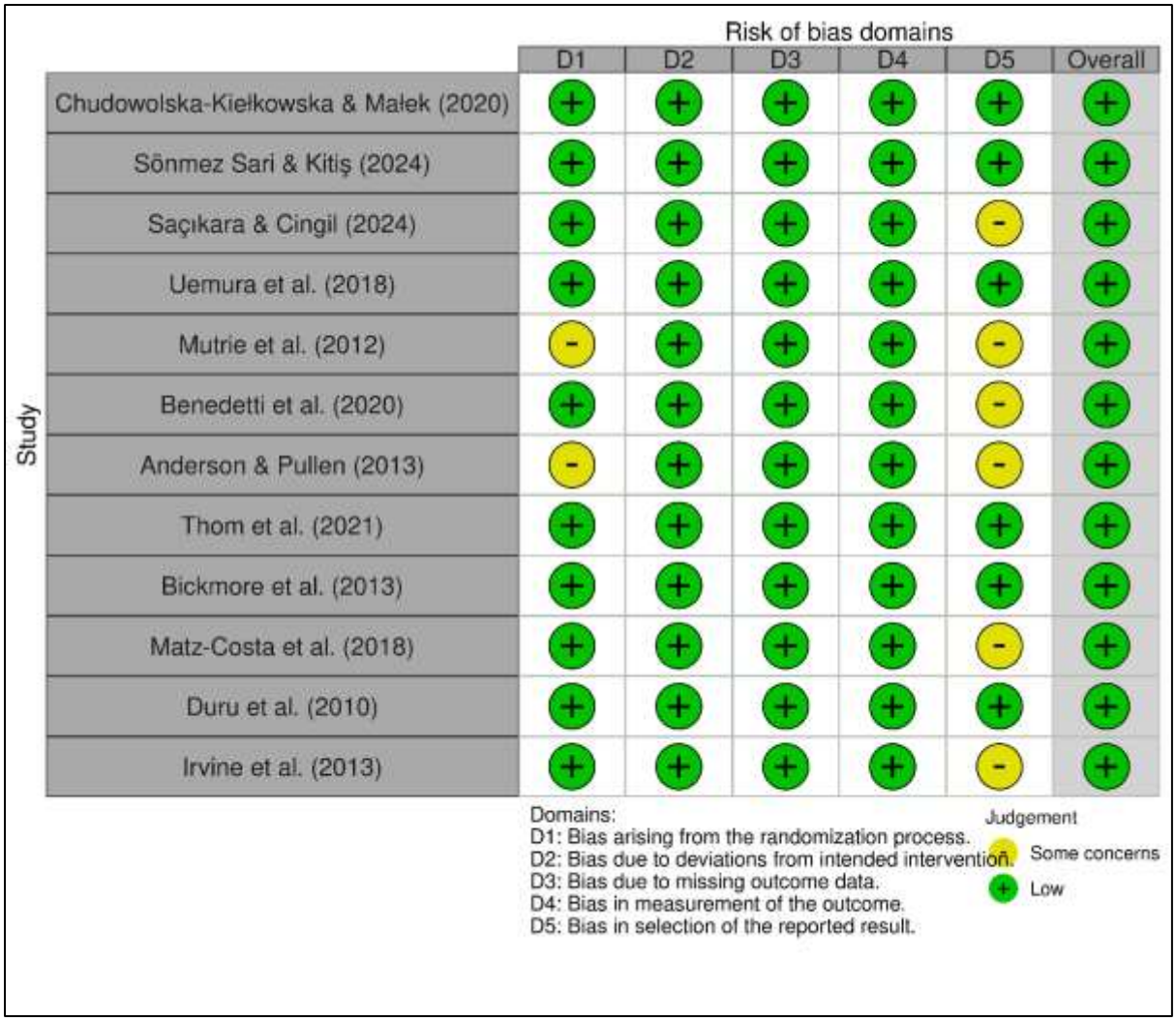

Figure 3: Bias assessment using the RoB 2.0 tool.

DISCUSSION

The physical activity outcomes evaluated in a significant part of the studies under review show definite positive changes as a high number of steps taken, stronger cardiovascular (CV) characteristics, and higher quality of life (QoL). As an example, Chudowolska-Kiełkowska & Malk (2020) revealed that nurse-guided goal setting associated with pedometer wearing and supportive phone calls effectively changed the number of steps taken per day, blood pressure, and metabolic indicators in the sedentary participants of older adults with cardiovascular risks. In a similar way, S Helen Sari & Kiti (2024) employed the Transtheoretical Model (TTM) of motivational interviewing, which successfully got more than 70 percent of the participants into the "action" phase, and simultaneously showed record improvements in PA and self-efficacy.

Such findings like those of Mutrie et al. (2012) and Anderson & Pullen (2013) suggest that culturally/spiritually customized interventions administered with the help of nurses can eliminate the barriers and become a great motivator. Spiritual PA performed by a group and conducted by nurses resulted in long-term changes in PA behaviour and exercise attitudes.

Here, it is worth noting that a few of these interventions involved wearable technology or digital elements. As an illustration, Bickmore et al. (2013) applied a virtual nurse avatar which had led to the short-term step rises, but its efficiency was few in the long run. However, the research conducted by Zhang et al. (2020) on wearable trackers showed that users have high adherence and low satisfaction with technology, indicating the significance of easy-to-use designs and digital literacy in elderly people.

Some of the studies measured the long-term effects that lasted after the active implementation period. To give an example, Thom et al. (2021) conducted a study in which the participants of the nurse-

facilitated behaviour change group sustained improvements in diet and PA at 12 months. On the same note, Mutrie et al. (2012) found that there were positive changes after the intervention that remained significant in step count and QoL. Such results indicate that higher success rates of behaviour change can be achieved when nurses participate in the goal-setting and follow-up process which is structured.

Among the trials, the trial by Rich et al. (2017) can be noted to be large in scale and longer-term application (1824 months) and involved a hybrid model where peer leaders were trained by nurses. Besides intensifying PA and enhancing QoL, this strategy proved that scaling of interventions was feasible, i.e., changing the role of leaders to members of the communities with professional supervision.

Although the overall aim of the studies was to improve physical activity, a lot of interventions produced secondary effects as well, delivering improvement in social isolation, cognitive-related function, and enhanced mental health. As an example, Wallace et al. (2014) emphasized the importance of the 12-week community-based exercise program with the help of nurses by confirming the reduced feelings of social isolation an especially salient finding that the prevalence of the feeling of loneliness among older adults is high. As well, Uemura et al. (2018) focused on positive changes in physical health along with health literacy, memory, and balance making the conclusion that nurse-led health education could result in cognitive and functional benefits.

Besides, articles like Frosch et al. (2010) and Matz-Costa et al. (2018) present the evidence of how psychological activation, social engagement, and adherence can be enhanced with the descriptions of group discussions facilitated by the nurse and peer mentoring, and such evidence produces the idea that social components are part of effective interventions. Such pilot studies: those by Frable et al. (2025) and Lavoie & Dube (2025) were aimed at determining the feasibility, engagement of findings and acceptability. They indicated good participant enjoyment, rates of attendance and few negative events indicating the feasibility of implementing nurse-led programs in clinical practice. Muramatsu et al. (2018) also indicated the ways that nurse-trained aides can encourage daily PA in Medicaid home care recipients, which indicates that even non-nurse personnel can be efficiently involved in the process when led by nurses.

Notably, the articles by Petrescu-Prahova et al. (2019) and Di Pumpo et al. (2024) covered both the systemic and implementation levels. They imply that the nurse-based means of referral and nursing-related digital health approach (DHI) can improve program enrolment, compliance, and connecting healthcare systems more effectively with community-based PA programs. The international perspective of the review, which includes such countries as the USA, UK, Poland, Japan, Turkey, Brazil, and Taiwan, highlights the versatility of nurse-developed PA intervention on different cultural, socioeconomic, and healthcare contexts. Although this aspect varies across different healthcare systems and relations of community resources, such differences are still universal in terms of the role of nurses in health promotion.

Nurse-assisted interventions provided large improvements in PA in settings with low and medium income such as Brazil and Turkey. Nevertheless, even studies in such environments, such as Benedetti et al. (2020), noted staff load concerns, which implies ease of use and institutional assistance. The interventions that were reviewed have used delivery mode diversity: face-to-face, virtual, group-based, and hybrid. PA as well as feedback on it was monitored by digital tools (e.g., apps, smart bracelets, eHealth platforms) with varied experience between users. As an example, a web-based nurse-designed intervention showed sustained improvements in all 14 PA and health outcomes, according to Irvine et al. (2013), proving the possibility of such online tools in case they are developed with matching the needs of users.

Such group-based methods as noted in the study by Turk et al. (2016) and Werner et al. (2014) facilitated socialization and group-based motivation which is especially useful among older communities that are susceptible to isolation. Engagement and sustainability were also promoted by the use of peer mentorship that was repeated in various studies. Although the overall results proved to be positive, some of the possible challenges were identified. To begin with, the engagement can be influenced by the technological barriers, which are evident in the work by Zhang et al. (2020), and manifest themselves through the inability of older adults lacking digital expertise to engage in activities. Second, increased nurse workload and the complexity of interventions, as outlined by Benedetti et al. (2020), have to be addressed with sufficient training and support and simplified protocols. Third, the findings of studies like Lavoie and Dube (2025) were only partial implying that there should be complete reporting of outcomes coupled with long follow-ups to determine real effects.

In addition, as powerful evidence constituted randomized controlled trials, some studies were pilot or quasi-experimental. Better-powered RCTs that are larger and standardized, outcome measures and been performed to create stronger evidence to prove longevity of effectiveness and cost-effectiveness. The result of this review is solid, demonstrating that nurse-led interventions on PA need to become part of regular community health programs among older adults. Nurses have a special opportunity through accessibility, trustworthiness and integrative care. The policymakers can invest in the nurse training and resource deployment to scale such interventions given the fact the aging populations and health costs associated with the lifestyle are increasing around the world. The popularity of low-tech socially engaging and behaviour change based interventions proves that interventions do not always have to be costly in terms of infrastructure. Rather, the notion of capacity building among the nurses and using the available community resources may be a more viable route towards achieving active aging.

Limitations

There are a number of limitations in this review. The diversity of studies included in the review in their design, the type of intervention, the duration of the intervention, and the measurement of outcomes was high, which did not facilitate their comparison or synthesis. Most were small surveys or pilot studies that had limited follow-up time, lacking in their generalizability and understanding of the long term impacts. Some were based on self-reported results, which gave it a possibility of bias. Also, the majority of studies have been done in influential nations and could not be applicable in a low-resource condition. The problem of accessibility and older adults-uses of technology was also encountered in cases of digital interventions.

Future Directions

In future research, there should be an attempt to fill the gaps with large-scale, well-powered random controlled trials with standardized intervention protocols and outcomes that allow the comparison of studies. Longitudinal follow-ups have to be conducted in order to evaluate the long-term sustainability of physical activity and health outcomes. More culturally competent and context-specific interventions, particularly within more diverse and less-resourceful community environments are also required to enable equity and inclusiveness. Interventions run by nurses should be considered to include components of both behavioural and environmental support and to pursue a low-cost approach that may be adopted in routine health programs at the community level. In addition, it is recommended that future research should examine cost-effectiveness, feasibility, and acceptability of the technology-assisted interventions on older adults with different online literacy levels. Last, participatory methodologies, which engage older adults in the co-design process of the interventions, can overcome this issue because they increase participation levels and relevance, which subsequently lead to better adherence and health outcomes in the long run.

Conclusion

This systematic review identifies the importance of the work of public health nurses (PHNs) in improving physical activity in older people through some interventions that are supposed to be provided through community-based recreation centers. The evidence supports the statement that PHNs with the direct facilitation (e.g., structured exercise programs) and indirect support (e.g., motivational interviewing, telehealth guidance, goal setting) can help increase physical activity levels, improve cardiovascular health indicators, self-efficacy, and the quality of life in older populations very much. Such interventions were quite safe, acceptable and could be adjusted to different cultural and community backgrounds. Nurse-led interventions on physical activity promotion succeed based on their accessibility, credibility and being a comprehensive part of the patient care. PHNs can meet the needs of communities, including older adults, in clinical practice and within the community health sphere because PHNs can collaborate with them. In addition, they can personalize intervention according to each person needs, preference, health status, and obstacles and thus improve compliance and longer-term behavior modification.

Nevertheless, there are still problems regarding implementation. These are nurse workload, inadequate funding or facilities in part of the community environment, and the digital literacy of the older adults that may differ considerably. The responses to these barriers will need the investments in workforce development, interprofessional collaboration, easier intervention protocols, and context-relevant

strategies, particularly in the low-resource settings. Since aged populations are steadily rising across the world today, it is not only advantageous but also a necessity to incorporate practice of advocating physical activities into normal nursing practice on a community basis. A policy approach, innovative digital ideas, and integration can increase nurse-led initiatives on a national level and as part of national aging and public health systems. The future studies should be concerned with long-term effects, cost-effectiveness, and the ways to gain more inclusiveness, cultural competence, and sustainability.

Conflict of Interest

The authors declare they don't have any conflict of interest.

Author contributions

The original author and the supervisor of the cross-ponding author wrote the initial drafts of the work. Each author contributed to the article, gathered information, edited it, made tables, and obtained approval before submitting it to a journal for publication.

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