Development of Otago Exercise Programme delivered via tele-physical therapy of fall prevention in rural Thai older adults

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Abstract

Background and aims: Thailand has rapidly transitioned to a complete aged society, with falls constituting a major, preventable cause of injury and functional decline among older adults. Scalable, home-feasible programmes that target balance and strength, such as the Otago Exercise Programme (OEP), may mitigate fall risk. Tele-physical therapy could enhance access in rural settings. This study evaluated the feasibility and effectiveness of a 12-week, home-based modified Otago Exercise Programme (OEP) delivered via tele-physical therapy for community-dwelling older adults at intermediate risk of falls in rural Thailand.

Methods: A mixed-methods study comprising a randomized controlled trial (RCT) with qualitative in-depth interviews was conducted at Ban Pong Hospital and 24 affiliated primary care units, Ratchaburi Province, Thailand. Community-dwelling adults with intermediate fall risk, without high-risk features, were eligible. Of 65 screened, 50 were randomised to intervention (n=25) or control (n=25). The intervention was a modified Otago Exercise Programme (OEP) (17 balance and strength exercises plus walking) delivered via tele-physical therapy (video calls, pre-recorded videos, and manuals), three 30–40 min sessions/week for 12 weeks. Controls received usual care. Primary outcomes were Short Physical Performance Battery (SPPB) and Activities of Daily Living (ADL).

Results: At baseline, there were no statistically significant differences between the intervention and control groups in demographic or clinical characteristics ($p > 0.05$). After 12 weeks, the intervention group demonstrated significant improvements ($p < 0.05$, Cohen's $d = 0.7$ for gait speed) compared with controls across all domains of the Short Physical Performance Battery, including balance, gait speed (0.72 ± 0.11 to 0.89 ± 0.14 m/s), and chair stand test (12.8 ± 2.1 to 10.3 ± 1.9 s) ($p < 0.05$). No significant changes were observed in the control group. Activities of Daily Living independence was maintained in both groups. Exercise adherence in the intervention group was 100%.

Conclusions: The 12-week, tele-delivered modified Otago Exercise Programme (OEP) effectively improved physical performance among rural Thai older adults at intermediate fall risk, with excellent adherence and no reported adverse events. These findings support the potential of tele-physical therapy as an accessible strategy for fall prevention in community settings. Larger, longer-term trials are warranted to evaluate fall incidence, durability of benefits, and cost-effectiveness.

Keywords: Falls, Otago Exercise Programme, Tele-physical therapy, Older adults, Thailand

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Introduction

Population ageing is a global phenomenon with profound health and social implications. In the Asia–Pacific region, approximately 721 million people aged 60 years or older were reported in 2024, representing about one in seven persons[1]. Thailand officially became a "complete aged society" in 2022 when over 20% of its population were aged 60 years or older, and projections indicate that by 2037 this proportion will exceed 30%, classifying the nation as a "super-aged society"[2]. This demographic transition underscores the urgent need to strengthen geriatric care and preventive strategies, particularly in rural and community settings.

Falls represent one of the most pressing public health challenges among older adults worldwide. Approximately one in three adults aged 65 years and above experiences at least one fall annually, with 14–32 percent sustaining serious injuries such as fractures, dislocations, or head trauma, and 2–6 percent suffering hip fractures[3–5]. In Thailand, an average of three older adults die every day from fall-related injuries [6]. Beyond the immediate physical harm, falls contribute to long-term disability, hospitalisation, loss of independence, and considerable socioeconomic burden for families and the healthcare system.

Risk factors for falls are multifactorial, encompassing biological, behavioural, environmental, and socioeconomic domains. Common contributors include sarcopenia, impaired balance, sensory loss involving the visual, vestibular, or somatosensory systems, cognitive decline, polypharmacy, inappropriate footwear, unsafe home environments, social isolation, and limited financial resources [7–12]. Local epidemiological data highlight the magnitude of the problem in Thailand: in 2019, a survey in Nam Khun District, Ubon Ratchathani Province reported that 9.95 percent of older residents had fallen within the previous year[13], while a 2024 survey in Ratchaburi Province revealed that 21.87 percent of older adults reported at least one fall within six months, most commonly occurring inside the home due to slips or trips on uneven surfaces[14].

Physical activity is widely recognised as one of the most effective interventions for fall prevention. Multicomponent exercise programs, incorporating balance, strength, and gait training, demonstrate superior effectiveness compared with single-modality exercise[15]. The Otago Exercise Programme (OEP) is a structured, evidence-based, home exercise program originally developed at the University of Otago, New Zealand, by Campbell and Robertson. It was designed specifically to reduce falls among community-dwelling older adults through individually tailored exercises that enhance lower-limb strength, balance, and mobility. The program consists of 17 progressive exercises targeting major muscle groups of the legs and trunk, incorporating both static and dynamic balance components such as knee bends, heel raises, backward walking, sideways walking, and sit-to-stand practice combined with regular walking sessions. Each participant progresses through levels of difficulty based on functional ability, supervised initially by a trained physiotherapist and followed by periodic home visits or tele-guidance to ensure safety and adherence. The exercises are typically performed three times per week, taking approximately 30-40 minutes per session, with a walking component at least twice weekly. Physiologically, the Otago Exercise Programme (OEP) improves proprioceptive control, muscular strength, and postural stability, leading to enhanced gait speed and reduced sway during standing and walking. Regular engagement has been shown to increase ankle and knee extensor strength, improve step length, and reduce reaction time—all of which contribute to better balance control and a lower risk of falls[16-19]. Multiple systematic reviews and meta-analyses have confirmed the program's efficacy, demonstrating a 35-40% reduction in fall incidence among community-dwelling older adults, along with improved functional mobility and confidence during ambulation[20]. The OEP's structured, adaptable design and its proven safety make it suitable for remote or tele-supervised delivery, particularly in settings where in-person rehabilitation is limited.

In Thailand, community-based exercise programs such as the Active Ageing Exercise Program (Department of Health, Ministry of Public Health) and the 3-Set Strength and Balance Exercises (Thai Health Promotion Foundation) primarily emphasize general physical activity, flexibility, and social participation. While these programs effectively promote overall mobility, they often lack structured progression and measurable intensity specifically targeting lower-limb strength and balance control. In contrast, the Otago Exercise Programme (OEP) is a standardized, evidence-based intervention consisting of progressive resistance and balance exercises combined with walking practice. The Otago Exercise Programme (OEP) is designed to be individually tailored, easy to administer at home, and adaptable for remote supervision, making it particularly suitable for older adults in rural Thailand who face transportation barriers and limited access to physiotherapy services.[16-20]

While the COVID-19 pandemic accelerated the adoption of telehealth and remote rehabilitation worldwide, the continued relevance of tele-delivered interventions extends far beyond pandemic-related restrictions. In Thailand, significant disparities remain between urban and rural regions in terms of access to rehabilitation services, qualified physiotherapists, and transportation infrastructure[21, 22]. Tele-physical therapy offers a sustainable model to bridge these accessibility gaps, allowing older adults in remote communities to receive supervised, evidence-based exercise programs without the need for frequent hospital visits[23].

Recent studies have demonstrated that tele-rehabilitation can achieve functional outcomes comparable to conventional in-person therapy while improving adherence and reducing travel burden [24, 25]. Furthermore, post-pandemic trends indicate that older adults are increasingly familiar and comfortable with digital communication platforms, enhancing the feasibility of long-term telehealth implementation in this age group [26].

From a health systems perspective, integrating tele-physical therapy into community-based care aligns with Thailand's "20-Year National Strategic Plan for Digital Health Transformation," which emphasizes the use of digital tools to promote healthy ageing and equitable care delivery[27]. Thus, the telehealth approach remains not only relevant but also necessary to support accessible, cost-effective, and scalable fall-prevention interventions for older adults in underserved settings.

Despite this promising evidence, challenges remain regarding digital access, long-term adherence, and cost-effectiveness. Moreover, research in Thailand has rarely focused on older adults in suburban communities who are at intermediate risk of falls a group often overlooked in both prevention and rehabilitation initiatives. However, no previous randomized controlled trials have evaluated a tele-delivered Otago Exercise Programme (OEP) among rural Thai older adults with intermediate fall risk. Addressing this gap, the present study aims to evaluate the feasibility and effectiveness of a modified Otago Exercise Programme delivered via tele-physical therapy for fall prevention among older adults in suburban Thailand.

Materials and methods

Study design and setting

This study employed a mixed-methods design, consisting of a randomized controlled trial (RCT) complemented by qualitative in-depth interviews. A qualitative component was included to complement quantitative findings and provide a deeper understanding of participants' perceptions, experiences, and contextual factors influencing adherence and engagement with the tele-delivered Otago Exercise Programme (OEP). While the quantitative phase evaluated the intervention's effectiveness, the qualitative interviews aimed to explore how participants interacted with the program, perceived its benefits and challenges, and identified barriers and facilitators to implementation in real-world community settings. This mixed-methods approach was expected to enhance the ecological validity of the study and inform future scale-up and adaptation of the intervention. The RCT evaluated the effectiveness of a tele-physical therapy intervention based on a modified Otago Exercise Programme (OEP) for fall prevention among community-dwelling older adults, while qualitative interviews explored participants' experiences and perceptions. The study was conducted at Ban Pong Hospital and 24 affiliated primary care units in Ratchaburi Province, Thailand. Ethical approval was obtained from the Ban Pong Hospital Human Research Ethics Committee (COA No. 005-2024).

Participants

Eligible participants were community-dwelling older adults aged over 60 years who were able to communicate in Thai and were receiving routine care from Ban Pong Hospital or its affiliated primary care units. All participants were classified as having an intermediate risk of falls in accordance with the World Guidelines for Falls Prevention and Management for Older Adults[28]. This classification required a positive response to at least one of three screening criteria: a documented history of one fall within the previous year, self-reported unsteadiness during standing or walking, or concern about falling. In addition, participants were required to exhibit objective gait or balance impairment, operationalized as a gait speed of less than 0.8 m/s or a Timed Up and Go (TUG) time exceeding 15 seconds.

Individuals were excluded if they presented with conditions that could compromise safety or interfere with participation in the exercise programme. Exclusion criteria included a history of two or more falls within the past year, any fall resulting in significant injury, the presence of clinical frailty, prolonged inability to rise after a fall, or a history of syncope. Participants were also excluded if they had undergone hip, knee, or ankle surgery within the preceding year. Additional exclusion criteria comprised neuromuscular or musculoskeletal disorders known to affect lower-limb strength such as stroke, cancer, HIV/AIDS, or spinal pathologies—as well as cognitive impairment as determined by the Thai Mental State Examination (MMSE-Thai 2002), adjusted for educational level.

Sample size

A priori power analysis was performed using G*Power 3.1[29], assuming a medium effect size (Cohen's d = 0.5), 80% power, and alpha of 0.05. The minimum required sample size was 50 participants, which was achieved through recruitment from hospital records of older adults at intermediate risk of falls.

Randomisation and allocation

Participants were randomly assigned to intervention or control groups using block randomisation (block size = 4) with a 1:1 allocation ratio. Randomisation was performed by an independent research assistant using computer-generated sequences, with allocation concealed in opaque, sealed envelopes.

Intervention

The intervention group received a 12-week modified Otago Exercise Programme (OEP) delivered via tele-physical therapy. The programme comprised 17 progressive balance and strength exercises, supplemented with walking activities, tailored to individual functional levels and home environments. Delivery modes included:

- Pre-recorded instructional videos
- Printed instructional manuals

- Real-time supervision via a communication application (Line)

Participants completed three sessions per week, each lasting 30–40 minutes, at moderate intensity. In addition to strength and balance exercises, participants were instructed to perform walking training three times per week for 20–30 minutes per session at a self-selected, moderate intensity ("somewhat hard" on the Borg Rating of Perceived Exertion). The duration and frequency of walking were gradually increased as tolerated to promote cardiovascular endurance and gait stability. Progression was achieved by gradually increasing repetitions and duration. The control group received standard care comprising routine health services without structured exercise guidance.

Outcome measures

Primary outcomes

- Short Physical Performance Battery (SPPB): assessing balance, gait speed, and lower-limb strength
- Barthel Index of Activities of Daily Living (ADL): assessing functional independence

Secondary outcomes

- Timed Up and Go (TUG): measuring functional mobility and fall risk
- Self-reported falls and adherence: collected using exercise diaries and monthly follow-up calls
- Test–retest reliability of the SPPB was evaluated in a separate sample of 50 older adults, yielding excellent reliability (ICC 3,1 = 0.86).

Data collection procedures

Participants were recruited through Ban Pong Hospital and its affiliated primary care centres. Study information was provided verbally and in writing, and written informed consent was obtained prior to enrolment. Data were collected by trained research assistants under the supervision of the principal investigator. Training covered the administration of all outcome measures, adherence to standard operating procedures (SOPs), and standardised data recording. All research assistants were physiotherapists. Before the intervention commenced, they participated in a structured two-day training workshop conducted by senior physiotherapists in the Otago Exercise Programme (OEP). The training covered the OEP protocol, tele-supervision techniques, participant safety monitoring, and data recording procedures. Role-playing sessions and mock tele-supervised exercise trials were conducted to ensure consistency and competency in exercise instruction, participant interaction, and adverse event reporting. The research assistants were required to demonstrate proficiency in session delivery before independently conducting tele-supervised sessions.

Statistical analysis

Data analysis was performed using IBM SPSS Statistics version 29. Descriptive statistics were calculated for all variables. Continuous variables were tested for normality using the Kolmogorov–Smirnov test. Normally distributed data were analyzed using independent-samples t-tests for between-group comparisons and paired t-tests for within-group comparisons. Non-normally distributed data were analyzed using the Mann–Whitney U test and Wilcoxon signed-rank test, as appropriate.

Categorical variables such as sex, comorbidity status, frailty classification, nutritional status, and ADL independence were analyzed using the chi-square (χ^2) test to compare distributions between groups. In cases where expected cell counts were less than 5, Fisher's exact test was applied to ensure statistical validity. Effect sizes were calculated for significant results using Cohen's d for continuous variables and Cramer's V for categorical variables. Descriptive data are presented as means ± standard deviations (SD) for continuous variables and as frequencies and percentages for categorical variables. A p-value < 0.05 was considered statistically significant.

Qualitative analysis

Participants for the in-depth interviews were selected using purposive sampling to ensure variation in age, gender, and level of engagement with the tele-delivered Otago Exercise Programme (OEP). Specifically, individuals representing both high and low adherence levels, as well as different age groups (young-old: 60–69 years, middle-old: 70–79 years, and old-old: ≥ 80 years), were invited to participate. This sampling strategy aimed to capture diverse perspectives on program experiences, barriers, and facilitators to participation. Interviews were audio-recorded, transcribed verbatim, and analysed using conventional content analysis. Credibility was enhanced by member checking, and dependability was ensured through investigator triangulation.

Withdrawal and termination criteria

Participants could withdraw from the study at any time without consequence. The trial would be terminated if participants experienced severe adverse events, psychological distress, or upon recommendation from the ethics committee. All withdrawals and adverse events were documented and reported.

Results

Participant flow

A total of 65 older adults were assessed for eligibility; 15 were excluded due to not meeting inclusion criteria or comorbidities. Fifty participants were randomised equally into intervention (n = 25) and control (n = 25) groups. All participants completed the study. The CONSORT flow diagram is presented in Figure 1.

Baseline characteristics

Participants had a mean age of 68.2 ± 5.6 years (range 60–82), with 82% female. Hypertension (40%), hyperlipidemia (26%), and diabetes mellitus (24%) were the most common comorbidities. All participants were independent in activities of daily living (Barthel Index ≥ 12). Baseline demographic and clinical characteristics are shown in Table 1.

Pre-Intervention Comparison

At baseline, there were no statistically significant differences between groups in demographic, clinical, or functional characteristics, including ADL, cognitive status (MMSE-Thai 2002), frailty (FRAIL scale), nutritional status (MNA), or SPPB scores ($p > 0.05$) (Table 2).

Post-Intervention outcomes

After 12 weeks, the intervention group demonstrated significant improvements in physical performance compared with the control group. SPPB scores improved across balance, gait speed, and chair stand components ($p < 0.05$). Between-group comparisons indicated significant differences in gait speed, balance, and 5-times chair stand ($p < 0.05$). No significant changes were observed in the control group (Table 3).

Qualitative findings

The qualitative component explored participants' experiences, perceptions, and attitudes toward the tele-physical therapy–delivered Otago Exercise Programme (OEP). Three major themes emerged from the content analysis:

(1) convenience and accessibility

Participants emphasized that home-based, tele-delivered exercise allowed them to engage in rehabilitation without the need to travel to healthcare facilities. The flexibility of scheduling and elimination of transportation barriers were repeatedly cited as advantages.

"I like it very much. No need to travel to the hospital, and no need to bother my children." (Female, 72)

(2) Perceived Support and Motivation

Direct interaction with physical therapists via video communication provided reassurance and enhanced motivation. Participants appreciated the ability to receive immediate feedback and correction during exercises.

"I can talk directly with the physical therapist, see their face, and they can also check whether I am doing the exercises correctly or not." (Male, 70)

(3) Perceived Functional Benefits and Confidence

Many participants reported improved balance, increased walking confidence, and a greater sense of physical capability after completing the program. These subjective improvements were consistent with the quantitative gains observed in SPPB and gait performance scores.

Adherence to the tele-physical therapy OEP was excellent (100%), with all participants in the intervention group completing the prescribed 36 sessions over 12 weeks.

Table 1 Baseline demographic and clinical characteristics of participants (n =50)

Variable	Total (n = 50)	n (%) or mean ± SD
Age (years)	50	68.2 ± 5.6
60–69	40	80%
70–79	9	18%
≥ 80	1	2%
Sex: Male	9	18%
Female	41	82%
Hypertension	20	40%
Diabetes mellitus	12	24%
Hyperlipidemia	13	26%
Other (e.g., asthma, thyroid)	2	4%
No comorbidities	16	32%
Sarcopenia risk	13	26%
Cognitive impairment (MMSE < 23)	0	0%
ADL: Independent	50	100%
Frailty (FRAIL scale)	0	0%
Nutritional status:		
Normal	38	76%
At risk	12	24%

Table 2 Baseline comparison between intervention and control groups

Variable	Control (n = 25)	Intervention (n = 25)	p-value
Age (years)	62.5 ± 6.3	67.6 ± 5.3	0.34
Sex (male)	4 (16%)	5 (20%)	0.72
BMI			
<18.5	7 (28%)	4 (16%)	0.08
18.5–22.9	6 (24%)	9 (36%)	0.21
23.0–24.9	8 (32%)	6 (24%)	0.32
25.0–29.9	4 (16%)	3 (12%)	0.78
BMI ≥30	1 (4%)	2 (8%)	0.81
Cognitive impairment	0 (0%)	0 (0%)	1.000
ADL independent	25 (100%)	25 (100%)	1.000
Frailty (FRAIL)	0 (0%)	0 (0%)	1.000
Nutrition: Normal	23 (92%)	15 (60%)	0.08
Nutrition: At risk	2 (8%)	10 (40%)	0.06
Sarcopenia risk	6 (24%)	7 (28%)	1.000

Table 3 Post-intervention outcomes at 3 months

Variable	Control (n = 25)	Intervention (n = 25)	p-value
ADL independent	25 (100%)	25 (100%)	1.000
Sarcopenia risk	6 (24%)	6 (24%)	1.000
SPPB mild limitation	7 (28%)	2 (8%)	<0.05
SPPB minimal limitation	18 (72%)	23 (92%)	<0.05

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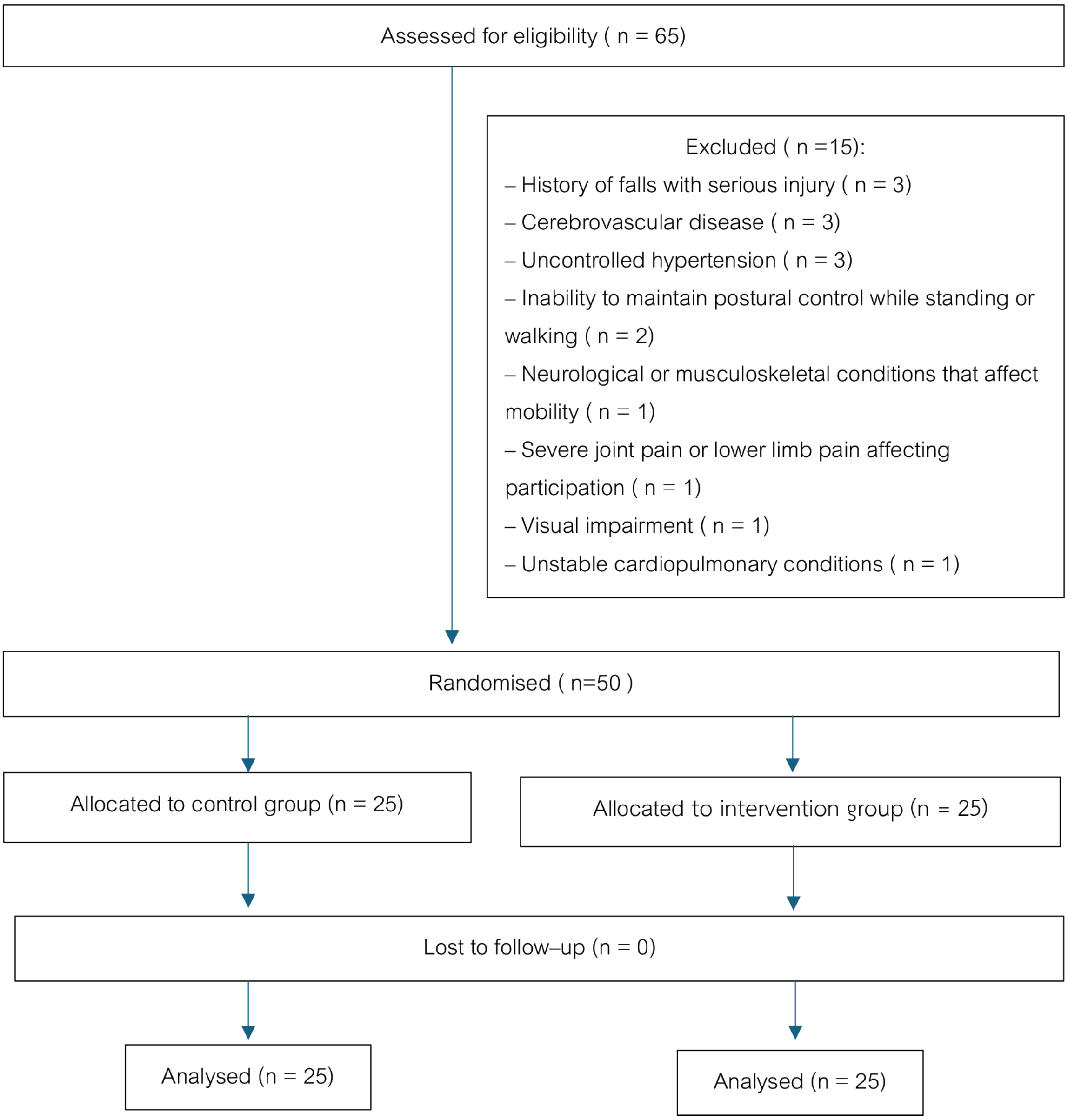

Figure 1 CONSORT Flow Diagram

Discussion

In this randomized controlled trial, a 12-week, home-based modified Otago Exercise Programme (OEP) delivered via tele-physical therapy significantly improved physical performance among community-dwelling older adults at intermediate fall risk. Improvements were observed across all domains of the Short Physical Performance Battery (SPPB), balance, gait speed, and chair-stand, while independence in activities of daily living was maintained. Adherence was excellent, with all participants in the intervention group completing all 36 prescribed sessions, demonstrating the feasibility and acceptability of this approach in a rural Thai context.

Our findings align with previous evidence showing that multicomponent exercise, particularly strength and balance training, is superior to single-modality exercise in preventing falls[7,15]. Specifically, Otago Exercise Programme (OEP) has been demonstrated to reduce fall incidence by up to 35–40% and improve lower limb strength and mobility in diverse populations[16–20]. Similar to studies conducted in Iran, Korea, and Serbia[18–20], this trial demonstrated clinically meaningful improvements in gait and balance performance. Importantly, our results extend this evidence by confirming the feasibility of fully tele-delivered Otago Exercise Programme (OEP) in a middle-income rural setting, where access to supervised in-person programs is limited.

Compared with other established fall-prevention and functional exercise programs, the Otago Exercise Programme (OEP) demonstrates both conceptual and practical strengths. Unlike generic multicomponent exercise regimens such as Tai Chi for Balance, Stepping On, or FaME (Falls Management Exercise), the OEP is specifically designed for individualized, home-based delivery, emphasizing progressive strength and balance training supervised by trained personnel[(28, 29)].

Previous studies have shown that Tai Chi, a widely used mind–body exercise, can improve postural stability, lower-limb strength, and proprioception; however, its effectiveness in reducing fall incidence varies depending on training intensity and duration (30). In contrast, the Otago Exercise Programme (OEP) has consistently demonstrated a 35–40% reduction in falls among community-dwelling older adults, supported by multiple randomized controlled trials and meta-analyses[(31, 32)].

Compared with group-based programs like FaME, which require in-person sessions, the Otago Exercise Programme (OEP) offers greater feasibility for older adults in rural or resource-limited settings, especially when delivered through tele-physical therapy. Both FaME and Otago Exercise Programme (OEP) include dynamic balance and functional lower-limb strengthening, but Otago Exercise Programme (OEP) simplified structure and home-based nature make it more adaptable for remote supervision and individualized progression[(33)].

Furthermore, unlike general resistance training programs that primarily target muscle hypertrophy, the Otago Exercise Programme (OEP) integrates task-specific activities such as sit-to-stand and tandem stance that directly enhance functional mobility and reduce fall risk. This specificity may explain the superior improvements in gait speed and chair stand performance observed in the present study compared with prior reports using general resistance or aerobic training alone[(34)].

The high adherence rate in this study may be attributed to the pragmatic design, which included video communication applications and printed manuals. These delivery methods reduced barriers related to travel and scheduling, consistent with previous reports that technology-supported interventions can improve adherence among older adults[21–23,27]. Furthermore, the results support the growing body of evidence indicating that tele-rehabilitation can achieve functional outcomes comparable to face-to-face interventions.[21,23,25]

These findings also have important implications for health policy. Given the rapid demographic shift towards a super-aged society in Thailand[1,2], scalable and cost-effective interventions are urgently needed to prevent falls, particularly in rural communities where healthcare access remains limited. Integrating tele-delivered Otago Exercise Programme (OEP) into existing primary care networks may represent a sustainable strategy for secondary fall prevention, supported by simple screening measures such as gait speed or Timed Up and Go (TUG) tests to identify suitable candidates[35].

Several challenges were encountered during the follow-up period. Some participants experienced difficulties maintaining consistent participation due to health fluctuations, caregiving responsibilities, or lack of family support. Technical issues such as unstable internet connections and limited digital literacy also affected adherence among older adults. Additionally, the long duration between post-intervention and follow-up assessments resulted in attrition, as a few participants relocated or became unavailable. These barriers highlight the need for additional technical support and more flexible follow-up strategies in future telehealth-based interventions.

Future research should explore long-term adherence and sustainability of tele-delivered Otago Exercise Programmes (OEP) among diverse populations of older adults, including those with comorbidities or limited digital literacy. Larger multicenter randomized controlled trials are needed to confirm the generalizability of the present findings across various community and healthcare settings. Additionally, mixed-methods studies incorporating behavioral and psychosocial variables could provide a deeper understanding of motivational factors influencing program engagement. Future work should also evaluate cost-effectiveness and the integration of telehealth exercise interventions within existing primary healthcare systems to ensure scalability and sustainability.

Conclusion

A 12-week, tele-delivered modified Otago Exercise Programme (OEP) was feasible and effective for improving physical performance in rural Thai older adults at intermediate fall risk. Based on the findings of this study, the tele-delivered, home-based modified Otago Exercise Programme (OEP) is recommended as an effective and feasible approach to enhance lower-limb strength, balance, and mobility among community-dwelling older adults. Primary care units and community health centers could incorporate tele-supervised Otago Exercise Programme (OEP) sessions into routine fall-prevention programs, particularly for older adults in rural or mobility-restricted settings. Training community health volunteers and caregivers to provide basic remote supervision may further improve adherence and safety during home exercise. Moreover, integrating tele-exercise platforms into the existing Thai Digital Health Strategy could support scalable implementation and long-term sustainability. Future studies should investigate cost-effectiveness, long-term adherence, and strategies for integrating behavior-change techniques into tele-delivered fall-prevention programs.

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