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ICF- and FITT-Based Physiotherapy for Hip Osteoarthritis in Older Adults: A Case Report

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Abstract
Background: Hip osteoarthritis (hip OA) is a degenerative musculoskeletal disorder associated with pain, reduced joint mobility, gait dysfunction, impaired balance, and decreased functional independence in older adults. Conservative physiotherapy based on the International Classification of Functioning, Disability and Health (ICF) framework and the FITT principle has been recommended to improve functional outcomes.
Objective: This case report aimed to evaluate the clinical outcomes of an ICF- and FITT-based physiotherapy program in an older adult with chronic left hip osteoarthritis.
Methods: A 63-year-old patient with chronic left hip pain underwent a structured physiotherapy program for three treatment sessions combined with a home exercise program (HEP). Assessment included the Numeric Rating Scale (NRS), hip range of motion (ROM), Manual Muscle Testing (MMT), Western Ontario and McMaster Universities Osteoarthritis Index (WOMAC), gait observation, and balance assessment. Interventions included infrared therapy, ROM exercise, strengthening exercise, balance training, gait training, and functional training.
Results: Pain during activity decreased from 6/10 to 3/10, while resting pain decreased from 3/10 to 1/10. Hip flexion improved from 110° to 120°, hip adduction from 5° to 10°, and hip external rotation from 35° to 45°. Hip adductor strength improved from 3/5 to 4/5. WOMAC score decreased from 43 to 25, accompanied by improved gait symmetry and standing balance.
Conclusion: An ICF- and FITT-based physiotherapy program may improve pain, mobility, muscle strength, gait performance, and functional activity in older adults with hip OA. However, these findings are limited to a single-case report.

Keywords
Osteoarthritis, Hip; Physical Therapy Modalities; Exercise Therapy; Rehabilitation

Introduction

Hip osteoarthritis (hip OA) is a progressive degenerative musculoskeletal disorder characterized by articular cartilage degeneration, subchondral bone remodeling, osteophyte formation, synovial inflammation, and gradual deterioration of joint biomechanics.[1,2] Hip OA is one of the leading causes of chronic pain, mobility limitation, and disability among older adults worldwide.[2,3] The global prevalence of hip OA continues to increase because of population aging, obesity, physical inactivity, and increased life expectancy.[4] In older adults, hip OA substantially affects independence, participation in daily activities, and overall quality of life.[3,5]

The clinical manifestations of hip OA commonly include pain, stiffness, reduced range of motion (ROM), muscle weakness, altered gait patterns, impaired balance, and decreased functional performance.[5,6] Degenerative changes in the hip joint alter biomechanical loading across the acetabulofemoral articulation, resulting in compensatory movement strategies and abnormal stress distribution during weight-bearing activities.[6,7] Persistent pain and reduced hip mobility may also impair neuromuscular activation of the hip stabilizing muscles, particularly the hip abductors and extensors, leading to gait dysfunction and reduced postural stability.[7,8] Consequently, patients with hip OA frequently demonstrate antalgic gait, shortened stance phase, decreased walking efficiency, and difficulty performing transfer activities such as stair negotiation and sit-to-stand movement.[8,9]

In addition to locomotor dysfunction, hip OA is associated with impaired proprioception and decreased dynamic balance, which increase fall risk and functional dependence in older adults.[9,10] Pain-related movement avoidance and chronic joint stiffness may further reduce physical activity participation and accelerate functional decline.[10] These impairments affect not only body structure and function, but also activity limitation and participation restriction, supporting the importance of multidimensional rehabilitation approaches based on the International Classification of Functioning, Disability and Health (ICF) framework.[11]

Current clinical guidelines strongly recommend conservative rehabilitation as the first-line management for hip OA before considering invasive interventions such as total hip arthroplasty.[12,13] Therapeutic exercise, gait training, balance training, patient education, and self-management strategies have demonstrated beneficial effects on pain reduction, mobility, and physical function in patients with hip OA.[13,14] Exercise therapy is considered a core physiotherapy intervention because it improves joint mobility, muscle performance, neuromuscular control, and functional independence while reducing disability progression.[14,15]

The FITT principle, consisting of Frequency, Intensity, Time, and Type, provides a structured approach for individualized exercise prescription according to patient tolerance and rehabilitation goals.[15,16] Integration of the FITT principle with the ICF framework allows physiotherapists to design more comprehensive rehabilitation programs that address impairment, functional activity, participation, and contextual factors simultaneously.[11,16] This integrated approach is particularly important in geriatric rehabilitation because recovery is influenced not only by physical capacity but also by exercise adherence, self-efficacy, and environmental support.[17]

Although previous studies have demonstrated the effectiveness of exercise-based rehabilitation for hip OA, reports describing the implementation of integrated ICF- and FITT-based physiotherapy in real-world clinical practice remain limited, particularly in local outcome-based case reports.[18] In addition, many reports focus primarily on pain reduction without comprehensively documenting serial changes in ROM, muscle strength, gait performance, balance, and functional activity.[19,20] Comprehensive clinical documentation is important to strengthen evidence-based physiotherapy practice and improve clinical reasoning in conservative hip OA management.

Therefore, this case report aimed to evaluate the clinical outcomes of an ICF- and FITT-based physiotherapy program in an older adult with chronic hip OA. Specifically, this report describes serial changes in pain intensity, hip mobility, muscle strength, gait performance, balance, and functional activity following a structured physiotherapy intervention program.

Methods

This study was prepared as a single-case report using a descriptive clinical approach and was written in accordance with the CARE (CAse REport) Guideline recommendations.[21] The report described the implementation of an evidence-based physiotherapy program based on the International Classification of Functioning, Disability and Health (ICF) framework and the FITT principle in an older adult with hip osteoarthritis (hip OA). All interventions represented routine physiotherapy management within a clinical rehabilitation setting.

The patient was a 63-year-old older adult diagnosed with left hip OA based on medical examination, radiological findings, and physiotherapy assessment. Radiographic findings were consistent with moderate hip OA according to the Kellgren-Lawrence classification.[22] The patient reported progressive left hip pain for approximately eight months before physiotherapy intervention. Symptoms worsened during prolonged standing, walking, stair negotiation, and transfer activities from sitting or squatting to standing. Before physiotherapy management, the patient had received symptomatic medication and activity modification but had not undergone previous structured rehabilitation therapy.

The patient had a body mass index within the overweight category and reported reduced participation in recreational walking because of pain exacerbation during weight-bearing activities. Daily physical activity level was low to moderate. The patient did not use a walking assistive device and had no major neurological or cardiopulmonary comorbidity limiting exercise participation. No red flag signs such as unexplained weight loss, severe night pain, recent trauma, or neurological deficit were identified during screening.[23] In addition, the patient reported decreased confidence during walking and prolonged standing because of instability sensation around the hip joint.

A comprehensive physiotherapy assessment was performed by the same physiotherapist throughout all treatment sessions to maintain consistency of examination procedures. Subjective assessment included pain history, symptom duration, aggravating and relieving factors, medication history, previous treatment, activity limitation, and participation restriction during daily living activities.
Objective examination included observation, palpation, gait assessment, pain examination, ROM measurement, muscle strength testing, balance evaluation, and functional outcome assessment. Observation revealed mild antalgic gait characterized by shortened stance phase on the affected side and guarded movement during ambulation. No apparent leg length discrepancy was observed during static standing assessment.[24] Palpation demonstrated tenderness around the lateral and anterior hip region accompanied by periarticular muscle tightness. Clinical examination also demonstrated pain provocation during FABER and FADIR tests, supporting the presence of hip joint dysfunction and capsular movement restriction.[25]

Pain intensity was assessed using the Numeric Rating Scale (NRS), with scores ranging from 0 to 10, where higher scores indicated greater pain severity.[26] Hip ROM was measured using a universal goniometer for flexion, extension, abduction, adduction, internal rotation, and external rotation movements. Universal goniometric assessment has demonstrated acceptable validity and reliability for hip joint measurement in musculoskeletal rehabilitation.[27] Muscle strength was evaluated using Manual Muscle Testing (MMT) using a standardized 0–5 grading scale. MMT remains widely used in clinical musculoskeletal assessment and demonstrates acceptable inter-rater reliability when standardized procedures are applied.[28]

Functional status was assessed using the Western Ontario and McMaster Universities Osteoarthritis Index (WOMAC), which evaluates pain, stiffness, and physical function in patients with osteoarthritis. Higher WOMAC scores indicate greater disability and functional limitation.[29] Balance and functional performance were evaluated through observation of standing stability, transfer ability, stair negotiation, and walking tolerance during clinical activities. All findings were subsequently mapped into ICF domains, including body structure and function, activity limitation, participation restriction, environmental factors, and personal factors.

Before presenting the intervention program, it is important to emphasize that the rehabilitation strategy was individualized according to symptom severity, pain response, movement quality, and functional limitation identified during assessment. The intervention program was designed according to the FITT principle consisting of Frequency, Intensity, Time, and Type to improve intervention reproducibility and clinical transparency.

Table 1. FITT-Based Physiotherapy Intervention Program

Intervention	Frequency	Intensity	Time	Type
Infrared therapy	Every session	Comfortable thermal intensity	10–15 minutes	Passive modality
ROM exercise	Every session	Low intensity	10 repetitions	Passive, active-assisted, and active exercise
Strengthening exercise	Every session	Low-to-moderate intensity according to tolerance	8–10 repetitions	Hip and lower extremity strengthening
Balance training	Every session	Progressive tolerance	10–15 minutes	Weight-shifting and standing balance exercise
Gait training	Every session	Symptom-limited	10 minutes	Walking retraining
Functional training	Every session	Progressive tolerance	10–15 minutes	Sit-to-stand and stair-climbing practice
Home exercise program	Daily	Self-tolerated	15–20 minutes	Independent exercise

The intervention consisted of infrared therapy, ROM exercise, strengthening exercise, balance training, gait training, functional training, stair-climbing education, and a home exercise program (HEP). Infrared therapy was administered before exercise to reduce pain and muscle stiffness. The modality was applied at an approximate distance of 45–60 cm from the treatment area for 10–15 minutes with the patient in a comfortable sitting position while monitoring skin response and patient comfort to prevent excessive heat exposure.[30] Exercise sessions were conducted under physiotherapist supervision, whereas the HEP was performed independently at home.

Strengthening exercises focused on the hip flexors, extensors, abductors, adductors, quadriceps, and hamstring muscles using low-to-moderate resistance according to patient tolerance. Functional training included sit-to-stand exercise, transfer practice, and stair negotiation retraining. Balance exercises emphasized weight shifting and supported standing activities to improve postural control and reduce instability during movement. Gait training focused on symmetrical weight-bearing, step-length correction, and walking safety during ambulation.

Exercise progression was performed gradually across sessions by increasing movement repetition, improving movement control, and reducing compensatory movement patterns according to patient tolerance. Pain monitoring was conducted throughout exercise sessions using symptom reports and movement observation. Exercise was modified or temporarily stopped if the patient experienced excessive pain exacerbation, fatigue, dizziness, or poor movement control.[31] No adverse events requiring intervention discontinuation occurred during the rehabilitation period.

The HEP included ROM exercise, strengthening exercise, walking practice, and activity-modification education**.** Exercise adherence was monitored verbally during follow-up sessions based on patient self-report regarding exercise frequency, tolerance, and perceived difficulty. Education regarding joint protection, pacing strategy, and the importance of long-term exercise adherence was also provided to improve self-management and rehabilitation compliance.[32]

Outcome evaluation was conducted at baseline, the first therapy session, and the third therapy session. Outcomes analyzed included changes in pain intensity, ROM, muscle strength, gait quality, balance performance, transfer ability, and WOMAC score. Because this study involved a single-case design, descriptive comparative analysis was used to evaluate serial clinical changes without inferential statistical testing.

To facilitate understanding of the clinical progression according to CARE recommendations, the patient management timeline is summarized below in text-flow format:

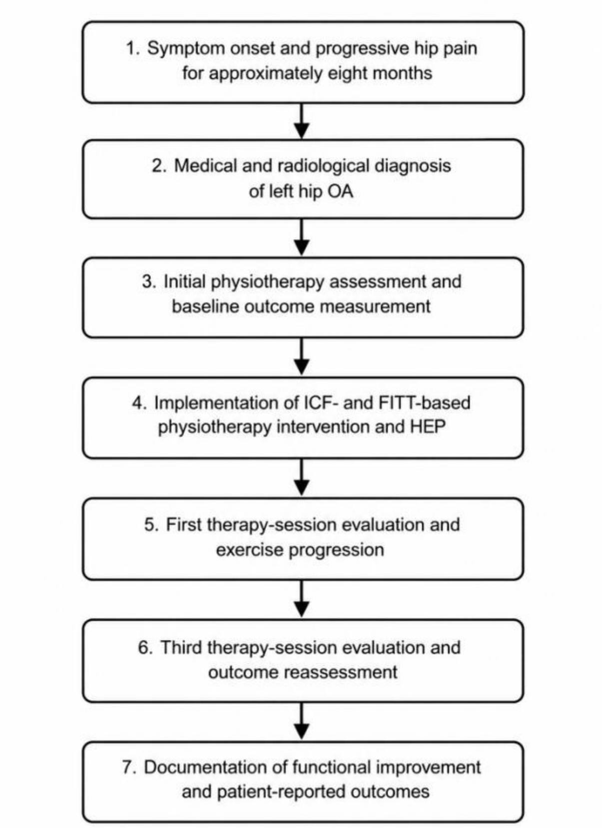

Figure 2. Patient Management Timeline and Rehabilitation Process for Hip Osteoarthritis

Written informed consent was obtained from the patient for publication of anonymized clinical information and rehabilitation outcomes.[33] All personal identifiers and confidential data were removed to maintain patient privacy and confidentiality throughout manuscript preparation.

Results

The patient completed three physiotherapy sessions combined with a home exercise program (HEP) without adverse events or symptom exacerbation requiring discontinuation of treatment. Progressive clinical improvement was observed throughout the intervention period, particularly in pain intensity, hip mobility, muscle strength, gait quality, balance performance, and functional activity. These findings were consistent with the rehabilitation goals established during the initial physiotherapy assessment.

To provide a comprehensive overview of serial clinical changes, integrated outcome progression is summarized in Table 2. The table presents changes in pain intensity, ROM, muscle strength, gait performance, balance, and functional ability across treatment sessions.

Table 2. Integrated Summary of Clinical Outcome Progression

Outcome Measure	Baseline	1st Therapy	3rd Therapy
Resting pain (NRS)	3/10	2/10	1/10

Pain during activity (NRS)	6/10	5/10	3/10
Hip flexion ROM	110°	110°	120°
Hip adduction ROM	5°	5°	10°
Hip external rotation ROM	35°	35°	45°
Hip adductor strength	3/5	3/5	4/5
Hip abductor strength	4/5	3/5	4/5
Gait performance	Antalgic gait with shortened stance phase	Improved weight-bearing tolerance	More symmetrical gait pattern
Standing balance	Reduced standing stability	Improved postural control	Improved standing confidence
Functional transfer ability	Difficulty during sit-to-stand and stair negotiation	Moderate improvement	Improved transfer independence
WOMAC score	43	43	25

As presented in Table 2, the patient demonstrated progressive improvement across multiple rehabilitation outcomes. The greatest clinical improvement was observed in pain during activity, WOMAC score, gait quality, and functional transfer performance. These findings indicated improvement not only in body structure and function, but also in activity and participation domains according to the ICF framework.

Pain intensity measured using the Numeric Rating Scale (NRS) progressively decreased during the intervention period. Resting pain decreased from 3/10 at baseline to 1/10 at the third therapy session, while pain during activity decreased from 6/10 to 3/10. Reduction in activity-related pain was accompanied by improved tolerance during walking, prolonged standing, and stair negotiation. Clinically, the patient also reported reduced discomfort during weight-bearing activities and improved confidence during daily movement.

Hip ROM evaluation demonstrated gradual improvement in mobility following intervention. To facilitate interpretation of ROM progression, detailed serial measurements are presented in Table 3.

Table 3. Changes in Left Hip Range of Motion

Movement	Baseline	1st Therapy	3rd Therapy
Flexion-extension	10°–0°–110°	10°–0°–110°	15°–0°–120°
Abduction-adduction	45°–0°–5°	45°–0°–5°	45°–0°–10°
External-internal rotation	35°–0°–5°	35°–0°–5°	45°–0°–5°

The ROM notation represented the movement arc measured using standardized goniometric assessment. Hip flexion improved from 110° to 120°, hip adduction improved from 5° to 10°, and hip external rotation improved from 35° to 45°. Improved mobility was particularly noticeable during functional activities requiring weight transfer and lower-extremity positioning, including sit-to-stand movement and stair negotiation.

Muscle strength evaluation also demonstrated gradual improvement during rehabilitation. Serial Manual Muscle Testing (MMT) findings are presented in Table 4.

Table 4. Changes in Hip Muscle Strength

Muscle Group	Baseline	1st Therapy	3rd Therapy
Hip flexors	4/5	4/5	4/5
Hip extensors	4/5	4/5	4/5
Hip abductors	4/5	3/5	4/5
Hip adductors	3/5	3/5	4/5

Hip adductor strength improved from 3/5 at baseline to 4/5 at the final evaluation. Hip abductor strength temporarily decreased during the first therapy session, likely because of pain-related muscle inhibition and movement guarding during early exercise exposure. However, strength returned to 4/5 at the third therapy session following reduced pain irritability and improved exercise tolerance. Hip flexor and extensor strength remained stable throughout intervention, indicating preservation of functional muscle performance during rehabilitation.

Functional improvement was further evaluated using the Western Ontario and McMaster Universities Osteoarthritis Index (WOMAC). Detailed WOMAC progression is summarized in Table 5.

Table 5. Changes in Functional Outcome Based on WOMAC

Parameter	Baseline	1st Therapy	3rd Therapy
Total WOMAC score	43	43	25

The WOMAC score decreased from 43 at baseline to 25 at the third therapy session, indicating improvement in pain, stiffness, and functional limitation. The magnitude of WOMAC improvement exceeded the minimal clinically important difference (MCID) commonly reported in hip OA rehabilitation literature.[34] Clinically, the patient demonstrated improved walking comfort, transfer ability, standing tolerance, and stair negotiation performance during daily activities.

In addition to standardized outcomes, serial observational assessment demonstrated gradual improvement in gait and balance performance. At baseline, the patient presented with mild antalgic gait characterized by shortened stance phase and guarded movement on the affected limb. During the final therapy session, gait became more symmetrical with improved weight-bearing tolerance and reduced compensatory movement patterns. Standing balance and movement confidence also improved progressively during rehabilitation.

Patient-reported outcomes further supported the objective findings. Initially, the patient experienced difficulty during prolonged standing, walking, and transfer activities because of pain and stiffness. Following intervention, the patient reported improved confidence during movement and stated that the HEP was understandable, feasible to perform independently, and beneficial for maintaining mobility between therapy sessions.

To summarize the overall clinical progression according to CARE-oriented reporting, the integrated rehabilitation outcome is presented below (Figure 2).

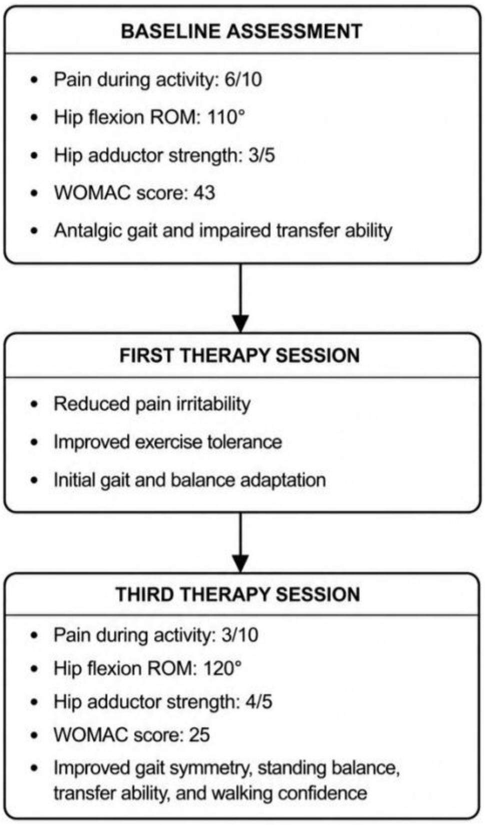

Figure 2. Clinical Progression During ICF- and FITT-Based Physiotherapy Intervention for Hip Osteoarthritis

Overall, the findings demonstrated clinically meaningful improvement following implementation of a structured physiotherapy program integrating the ICF framework and FITT principle in an older adult with hip OA.

Discussion

This case report demonstrated that a structured physiotherapy program integrating the International Classification of Functioning, Disability and Health (ICF) framework and the FITT principle was associated with clinically meaningful improvements in pain intensity, hip mobility, muscle strength, gait performance, balance, and functional activity in an older adult with hip osteoarthritis (hip OA). The findings support previous evidence showing that conservative exercise-based rehabilitation remains one of the primary management approaches for hip OA before invasive procedures such as total hip arthroplasty are considered.[12,35] The multidimensional improvement observed in this report also reflected the importance of combining impairment-focused intervention with functional and participation-oriented rehabilitation strategies.

One of the most clinically relevant findings was the reduction in pain intensity, particularly during activity-related movement. Pain during activity decreased from 6/10 to 3/10, accompanied by improved standing tolerance, gait quality, and transfer performance. Therapeutic exercise and movement-based rehabilitation may reduce pain through several physiological mechanisms, including improved synovial fluid circulation, reduced periarticular stiffness, enhanced neuromuscular activation, and decreased abnormal mechanical loading across the hip joint.[13,36] Improvement in movement confidence and reduction in fear-avoidance behavior may also contribute to decreased symptom severity during functional activity.[37]

Pain reduction in this report was also accompanied by improved muscle activation and movement control. Chronic pain in hip OA is frequently associated with arthrogenic muscle inhibition, particularly affecting the hip abductors and extensors that play essential roles in pelvic stabilization during gait.[7,38] Reduced pain may improve neuromuscular recruitment and motor control, allowing more efficient weight-bearing and movement performance during walking and transfer activities. This mechanism may explain the recovery of hip abductor strength after the transient decrease observed during the first therapy session. The temporary decline in muscle strength was likely related to pain-provoked protective inhibition rather than true muscular deterioration.

Improvement in hip ROM was another important outcome of the rehabilitation program. Degenerative hip OA commonly produces capsular restriction patterns and periarticular soft tissue tightness that limit functional movement.[7,8] The combination of passive ROM exercise, active-assisted movement, strengthening exercise, and functional training likely contributed to improved tissue extensibility and movement tolerance. Increased hip flexion, adduction, and external rotation were clinically meaningful because these movements are required for walking, stair negotiation, and sit-to-stand activities. Improved mobility may also reduce compensatory movement strategies and improve biomechanical efficiency during daily activities.[8,9]

Serial observational assessment demonstrated gradual improvement in gait symmetry and standing balance during rehabilitation. At baseline, the patient presented with antalgic gait characterized by shortened stance phase and guarded movement on the affected limb. These gait abnormalities commonly occur in hip OA because patients attempt to minimize pain and joint loading during ambulation.[9,10] Following intervention, gait became more symmetrical with improved weight-bearing tolerance and reduced compensatory movement patterns. Biomechanically, improved hip abductor activation and reduced pain-related compensation may contribute to better pelvic stabilization and walking efficiency during gait retraining.[39]

Balance and transfer performance also improved progressively throughout intervention. Hip OA is commonly associated with impaired proprioception, reduced postural control, and decreased dynamic stability, which may increase fall risk in older adults.[10,11] The incorporation of balance exercise, gait training, and functional retraining may improve sensorimotor integration and confidence during movement. In this report, improved standing stability and transfer independence were accompanied by greater confidence during walking and prolonged standing activities. These findings highlight the importance of integrating functional rehabilitation strategies into conservative hip OA management rather than focusing solely on isolated strengthening exercise.

The reduction in WOMAC score from 43 to 25 indicated clinically meaningful improvement in pain, stiffness, and functional limitation. Previous rehabilitation literature has reported that substantial reduction in WOMAC scores is associated with meaningful improvement in physical function and quality of life among patients with hip OA.[40] Importantly, the observed improvement extended beyond body-function outcomes and involved activity and participation domains, supporting the multidimensional rehabilitation approach emphasized by the ICF framework.[11]

The integration of the FITT principle and the ICF framework represented a major strength of this intervention approach. The FITT principle facilitated individualized exercise prescription according to symptom tolerance and functional capacity, whereas the ICF framework supported comprehensive clinical reasoning addressing body structure, activity limitation, participation restriction, and contextual factors simultaneously.[11,14] This integrated rehabilitation strategy is particularly relevant in geriatric physiotherapy because recovery outcomes are strongly influenced by self-management, adherence, psychosocial confidence, and environmental support.[15]

The HEP and patient education components likely contributed substantially to the observed outcomes. Long-term exercise adherence and self-management strategies are considered essential in conservative hip OA management because inactivity and movement avoidance may accelerate disability progression.[15,16] The patient reported that the HEP was understandable, feasible to perform independently, and beneficial for maintaining mobility between therapy sessions. Improved confidence during movement may also reflect increased self-efficacy resulting from repeated successful functional performance during rehabilitation.

Although infrared therapy was included as part of the intervention program, its contribution should be interpreted cautiously. Superficial thermal modalities may temporarily reduce pain and muscle stiffness through circulatory and thermal effects; however, evidence supporting long-term effectiveness in hip OA remains limited and somewhat inconsistent.[17] Therefore, the overall clinical improvement observed in this report was more likely attributable to the multimodal rehabilitation approach, particularly exercise therapy, gait retraining, and functional activity practice rather than passive modality application alone.

Non-specific therapeutic effects, including therapist-patient interaction, reassurance, increased therapeutic attention, and placebo-related mechanisms, may also have contributed to the observed symptom improvement.[41] Furthermore, because hip OA symptoms may fluctuate naturally over time, the possibility of partial natural recovery cannot be fully excluded. Consequently, interpretation of intervention effectiveness should remain cautious within the limitations of a single-case report.

Several limitations should be acknowledged. First, the intervention duration and follow-up period were relatively short for a chronic degenerative condition such as hip OA. Second, this report involved only a single patient without a comparison group, limiting generalizability. Third, objective gait analysis and instrument-based balance assessment were unavailable. Fourth, no blinded assessment was performed, and all assessments were conducted by the same physiotherapist, introducing potential observer bias. Finally, long-term adherence and sustainability of the rehabilitation outcomes could not be evaluated because long-term follow-up was unavailable.

Despite these limitations, this report provides clinically relevant evidence regarding the practical implementation of an ICF- and FITT-based physiotherapy program in conservative hip OA rehabilitation. Future studies using randomized controlled trials or longitudinal designs with larger sample sizes, objective gait analysis, standardized physical performance outcomes, and long-term follow-up are recommended to further evaluate the effectiveness and sustainability of this rehabilitation approach in patients with hip OA.

Conclusion

This case report demonstrated that a structured physiotherapy program integrating the International Classification of Functioning, Disability and Health (ICF) framework and the FITT principle was associated with improvements in pain intensity, hip mobility, muscle strength, gait performance, balance, and functional activity in an older adult with hip osteoarthritis (hip OA). Functional improvement was reflected by reduced WOMAC score, improved transfer ability, enhanced standing tolerance, and increased confidence during walking and daily movement activities.

The findings highlight the clinical relevance of combining therapeutic exercise, gait retraining, balance training, functional activity practice, patient education, and home exercise programs within a comprehensive conservative rehabilitation approach for hip OA management. Long-term exercise adherence and self-management should be emphasized to support sustained functional independence and mobility in older adults.

However, these findings should be interpreted cautiously because this report involved only a single patient with short-term follow-up and no objective gait analysis. Future studies using randomized controlled trials or longitudinal designs with larger sample sizes, standardized physical performance outcomes, and long-term follow-up are recommended to further evaluate the effectiveness and sustainability of ICF- and FITT-based physiotherapy interventions in patients with hip OA.

Clinical Implications

This report suggests that integration of the ICF framework and the FITT principle may assist physiotherapists in developing individualized rehabilitation programs targeting impairment, functional activity, and participation simultaneously. Multimodal physiotherapy intervention emphasizing therapeutic exercise, gait retraining, balance training, and home exercise adherence may provide clinically meaningful benefits for older adults with hip OA in conservative rehabilitation settings.

Study Limitations

Several limitations should be acknowledged in this report. The intervention duration and follow-up period were relatively short for a chronic degenerative condition such as hip OA. This report involved only a single patient without a comparison group, limiting generalizability of the findings. Objective gait analysis and standardized instrument-based balance assessment were unavailable. In addition, all assessments were conducted by the same physiotherapist without blinded assessment, introducing potential observer bias. Long-term sustainability of rehabilitation outcomes also could not be evaluated because no long-term follow-up was performed.

Patient Perspective

The patient reported that the physiotherapy program reduced hip pain and improved confidence during walking, standing, and transfer activities. The patient also stated that the home exercise program was understandable, practical to perform independently, and beneficial for maintaining mobility between therapy sessions. Improved comfort during daily activities was perceived as meaningful for functional independence and overall movement confidence.

Author Contribution

Shureenzen Suci Syafatillah: Conceptualization, Investigation, Data Curation, Formal Analysis, Writing – Original Draft Preparation.
Dwi Rosella Komalasari: Supervision, Methodology, Validation, Writing – Review & Editing, Project Administration.
Guntur Rusmana Putra: Resources, Clinical Supervision, Investigation, Writing – Review & Editing.

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Conflict of Interest Statement

The authors declare no conflict of interest related to this study.

Funding Sources

This study received no external funding.

Ethics Statement

This case report was prepared in accordance with the CARE Guideline recommendations for case-report reporting.[21] Written informed consent was obtained from the patient for publication of anonymized clinical information and rehabilitation outcomes.[40] All personal identifiers and confidential data were removed to maintain patient privacy and confidentiality throughout manuscript preparation.

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