

Rehabilitation Strategies in Orthopedic Physiotherapy: Enhancing Recovery and Mobility

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ABSTRACT

The aim of this review is to identify the current study results for the effect Rehabilitation strategies in orthopedic physiotherapy enhancing recovery and mobility in physiotherapy practice. Scanning of recent research an article was done through- Google scholar, Pedro and Pub-Med from 2010- 2024. Rehabilitation, Physiotherapy, mobility, enhancing recovery like terms were used to search data base. The primary search generated 50 possibly related publications, 5 articles out of 50 were finalized to include in this review depending on eligibility standards. These articles offer clear and valued perceptions into the direct and indirect effects of Rehabilitation strategies in orthopedic physiotherapy enhancing recovery and mobility in physiotherapy practice on several features of physiotherapy, together with clinical techniques, educational databases, and staffs primary forces. The results of this review are expected to serve as a brief reference guide for physiotherapists and instructors, guiding the growth of evidence-based approaches and procedures in managing the patients in several situations. On the other hand, it is acknowledged that further investigation is necessary to achieve a more extensive understanding of long term effects.

Keywords: Rehabilitation, Orthopedics, Physiotherapy, Enhancing recovery, Mobility

INTRODUCTION

Orthopedic conditions, including fractures, joint replacements, and musculoskeletal injuries, represent a significant challenge to both mobility and overall quality of life. These conditions often result in pain, functional limitations, and disability, which can profoundly affect a patient's ability to perform daily activities¹. Physiotherapy plays a pivotal role in addressing these challenges by enhancing recovery, restoring function, and improving mobility in individuals suffering from orthopedic conditions². Over the years, numerous rehabilitation strategies ranging from traditional exercise therapy to more advanced, technology-driven approaches have been developed and refined to optimize patient outcomes³.

Despite the proliferation of these techniques, there remains a pressing need for a comprehensive synthesis of their effectiveness to guide evidence-based clinical practice. By systematically evaluating the literature on rehabilitation interventions, clinicians can better understand the nuances of various strategies and their impact on patient outcomes, such as recovery timelines, functional mobility, and patient satisfaction⁴.

Therefore, this specialty area of physical therapy refers to orthopaedic physiotherapy-diagnosis, treatment, and management of disorders related to the musculoskeletal system that involves bones, joints, ligaments, tendons, and muscles⁵. To the injured patients in general, operated or chronic, this stream of treatment holds all importance for enabling them to achieve mobility, reduce pain, and enjoy better functions in general⁶. Rehabilitating techniques significantly play a role in orthopaedic physical therapy through which the healing process can be enhanced, clients can achieve long-term health, and the set goals by patients can be attained in terms of functional capacity. In these rehabilitation techniques, specific needs are assessed taking into account both psychological and physical factors that would impact the rehabilitation process⁷.

Orthopaedic physiotherapy requires better rehabilitation, as the musculoskeletal disorders are quite cunning and need not to be taken lightly in many cases⁸. Accidents with trauma, degeneration due to aging, occupational diseases, or sports traumas are some of the causes⁹. Every condition has its difficulties, so each rehabilitation program needs to be individualized and can include various therapy methods, exercises, and interventions¹⁰. With proper application of rehabilitation techniques that minimize the recurrence of injuries and prevent long-term disability, early intervention can improve one's prognosis. Thus, orthopaedic rehabilitation teaches patients new skills through which their bodies can restore strength, balance, and coordination for a better quality of life¹¹.

A combination of manual therapy, therapeutic exercises, electrotherapy, and education for the patient is a comprehensive, evidence-based approach that ensures these rehabilitation treatments are successful¹². In the most general terms, such

approaches aim at idealized tissue healing, improvement in joint function, and safe return to daily life or sports. Range-of-motion exercises, balance training, and progressive weight-bearing exercises are typical postoperative rehabilitation programs for knee or hip replacement patients¹³. The goal of such exercises is to allow some restoration of function with as little provocation of healing tissues as possible. Similarly, exercises that strengthen the core, train the patient in proper posture, and educate the patient on ergonomics can be very useful for decreasing pain and preventing recurrence in patients with chronic low back pain¹⁴. In this way, the time and intensity of these interventions, which need close assessment and adaptation according to further progress in the patient, are a decisive point for a successful process of orthopaedic rehabilitation.

Besides that, it is not easy to overlook the psychological aspect of rehabilitation. Recovery from an orthopaedic injury is such a process that is both physically and psychologically exhausting, as it often results with a feeling of disappointment, apprehension, or even a loss of spirit. Therefore, psychological care and motivational techniques are already included in any successful rehabilitation programmed to continue putting patients on their path to recovery. It has been found to motivate patients to participate in creating reasonable short- and long-term goals to keep them focused on the rehabilitation program. In doing this, physiotherapists can greatly improve patient results with a collaborative partnership and a favorable therapy environment.

The recent technological progress also has opened up various horizons of rehabilitation methods in orthopedic PT. Most importantly, the development of robotics assisted therapy, tele-rehabilitation, and virtual rehabilitation have made individualized and accessible more available to more patients. For example, these technologies are very helpful for patients that have poor access to in vivo therapy: they enable greater precision in monitoring patient progress, instantaneous feedback, and remote supervision. Moreover, such wearable technology and digital tools also proved to be useful in the monitoring of patient activities and compliance with the exercise regimen. So, contemporary techniques in rehabilitation are thus becoming more and more data-driven and patient-centered. This is what makes it all possible-end¹⁵.

This systemic review aims to examine the effectiveness of various rehabilitation strategies employed in orthopedic physiotherapy. By focusing on key outcomes, including recovery speed, functional mobility restoration, and overall patient satisfaction, this review will offer evidence-based insights into the most effective interventions. Ultimately, these findings will contribute to improved clinical decision-making and the development of best practices in orthopedic rehabilitation, leading to better patient care and quality of life.

Methods:

This review study is performed in accordance to PRISMA-Preferred Reporting Items for Systematic Reviews and Meta-Analyses¹⁶.

Search strategy:

The searching was done in PubMed, Google scholar and PEDro. Key words like- Rehabilitation, Physiotherapy, mobility, enhancing recovery etc. We included past 10 years articles (mainly RCTs-Randomized controlled trial) published in English language only from 2018 to 2024. This research was carried out from May 2024 to September 2024. The title and abstracts of all articles in the searches were screened in accordance with the inclusion and exclusion criteria to identify potentially eligible articles. Full texts of potential articles were read and assessed independently by the two reviewers.

Quality assessment:

Methodological quality of selected articles was assessed using PEDro Scale¹⁷ consisting of 11 questions in two aspects. Criteria 2–9 assess internal validity and criteria 10–11 assess statistical information required to make a study interpretable. Scoring of each question is done in accordance to its existence or nonexistence in the assessed study. The final scoring is done by the addition of all positive answers. Studies considered of high quality scoring ≥ 5 (5/10) as stated by Moseley et al¹⁸. Therefore in our review all included studies scoring ≥ 5 were found to be of high in methodological quality. The studies were analyzed in PEDro scale by two independent investigators.

Data analysis:

The screening of included articles was done by two independent investigators. The selected articles were analyzed in an organized manner including parameters given: author-year, study design, subjects-age, interventions, study duration, outcome measures, and results.

Differences between the investigators were solved by conversation to reach agreement and settled using Cohen's kappa statistics.

Results:

Studies identified After implementing the inclusion and exclusion criteria, 50 articles were retrieved using the key words-Rehabilitation, Physiotherapy, mobility, enhancing recovery. 15 articles were excluded as they were found in more than one database. For eligibility criteria, 35 articles were screened.

Further 30 articles excluded because either they were not available in full text, objective not available, they did not meet exclusion and inclusion criteria or no control group [Figure 1]. Finally, 05 articles were selected by agreement for quality assessment phase.

Quality assessment of study:

Average PEDro score of 10 selected articles was 6.9/10, this score might be due to various sources of bias which may affect the result. The commonest limitations were dearth of concealed allocation and blinding of patient, therapist, or assessor.

While assessing risk of bias through the selected articles, agreement between evaluators for Cohen’s kappa value was 0.83. In general, the final assessment for risk of bias specified that it was low in five articles, high in four articles, and unclear in the other one article.

Outcome Measures

The key outcome measures are- inadequate management, increased work demand, under-staffing, prolong working hours/absence of off-time, dearth of respectfulness, shortage of funds ,psychological clang, great insight, shortage of scope and growth in profession¹⁹.

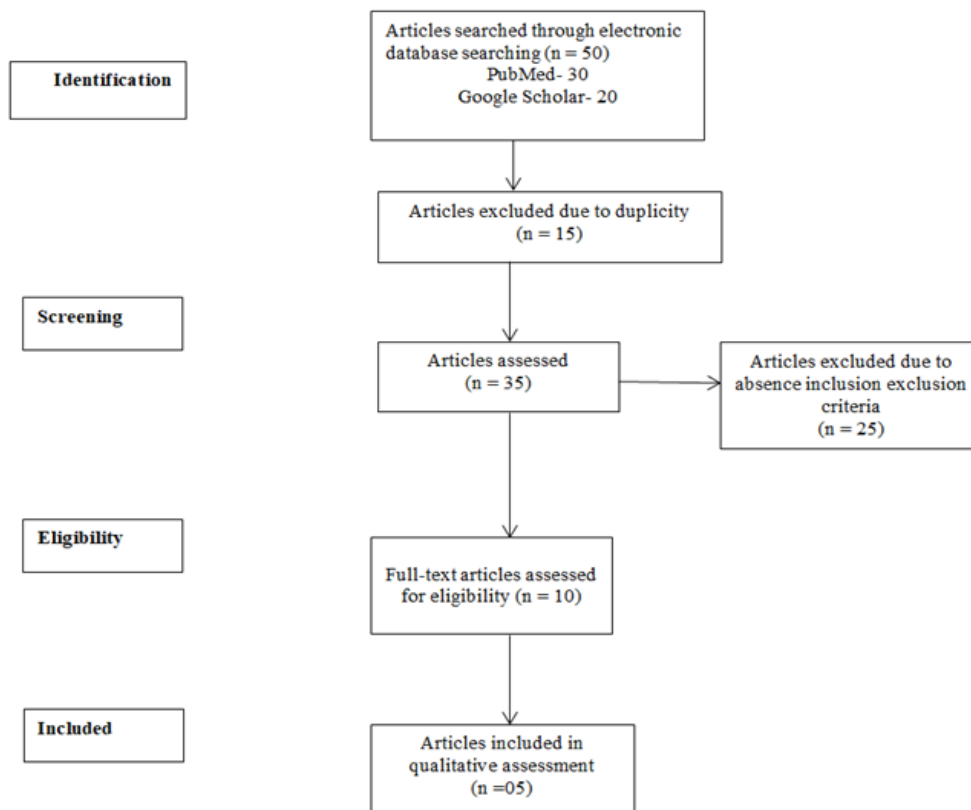


Figure 1: Flow diagram showing the screening and selection of articles

General data of the included studies:

In present study all related researches concised in Table-1 comprising of set of factors: author’s name, year of study, design of study, number of subjects, duration of study, outcome measures in the study, and final results. Out of the 5 studies included, one were survey¹¹, two was cross section study^{12,13}, one was Narrative study¹⁴, and one is qualitative research study¹⁵. All studies were conducted between 2021 and 2023.

Table 1: Description of the included studies:

Author	Study design	Subject	Study Duration	Outcome measure	Result
Vaishnavi S. Sharma , H V Sharath 2024 ²⁰	A Case report	1	2 months	Muscle strength, joint range of motion, and overall functional abilities, activities of daily living.	The successful outcomes suggest that a comprehensive and individualized rehabilitation program can significantly contribute to the recovery of individuals with similar conditions. Further research and documentation of such cases may provide valuable insights into optimal rehabilitation strategies for individuals with cervical spine injuries and associated neurological deficits.
Thomas Bandholm etl al 2018 ²¹	RCT	50	1 Month	THA, TKA, Rehabilitation	There is a major need to improve functional recovery after THA and TKA. We propose a strategy of “enriched” trials. where specific rehabilitation interventions are applied to different patients based on, for example, their expectations for post-operative recovery, willingness to undertake exercise and physical activity, and pre-operative functional performance.
Mohammed Hamad Alshahri, Adel Abdulrahman Almanee et. al 2022 ²²	Survey	NA	One time	Physiotherapy intervention encompass pain management, mobilization, range of motion exercises, strengthening, functional training, manual therapy, balance training, and patient education.	Physiotherapy plays a multifaceted role in the rehabilitation journey following orthopedic surgery, encompassing pain management, mobility restoration, strength improvement, functional training, and patient education. evidence-based interventions and individualized treatment plans, physiotherapists contribute significantly to the successful recovery and long-term well-being of orthopedic surgery Pt.
Shane M. McClinton , Bryan C. Heiderscheit et. al 2019 ²³	RCT	95	6 months	foot and ankle ability measure (FAAM), numeric pain rating scale (NPRS),	There was no significant benefit of uPOD+PT in the primary outcome of FAAM change at 6 months. Secondary outcomes and PP analysis indicated additional benefit of uPOD+PT, mostly observed in individuals who completed treatment.
Bente Holm, Morten Tange Kristensen et. al 2010 ²⁴	RCT	100	6 months	Verbal Analog Scale (VAS)), range of knee motion, functional mobility (‘Timed Up & Go’ (TUG) test), and walking distance	Pain has a limited influence on the functional recovery beyond the first postoperative day after TKA, thereby allowing early physiotherapy.

DISCUSSION

This systematic review demonstrate accelerated physiotherapy regimens, where the patient is mobilized within 24-hours of surgery, are the most beneficial active physiotherapy interventions during the acute hospital stay.

According McCoy CE study, this trial including the lack of difference in the primary outcome via ITT analysis may be due no additional benefit of uPOD+PT, explained by underestimation of uPOD+PT treatment effect in the ITT analysis²⁵. Other explanations for the lack of difference in the primary outcome of this study may be the pragmatic design that resulted in 11 participants in the uPOD group receiving physical therapy treatment over the course of the study. Although, it is possible that this muted between-group contrasts, post-hoc subgroup analyses were avoided to due lack of power and the high risk of spurious findings²⁶. Another consideration to explain the lack of difference is that uPOD+PT has a greater impact on certain patients, but less impact on others. Theoretically, the advantage of uPOD+PT is that physical therapists can perform manual therapy interventions, treat both local and proximal impairments contributing to PHP, and can facilitate return to higher level functions (eg, sports-related activities). Therefore, physical therapy treatment may be of greater benefit to those who have proximal impairments, are likely to benefit from manual therapy, or have goals related to return to sport-related activities. In this study, only the activities of daily living subscale, and not the sports subscale, of the FAAM was used to estimate change in function which may not capture the magnitude of change in patients functioning at a higher level. Also, while there is evidence supporting the additional benefit of manual therapy²⁷.

CONCLUSION

The results of this review are expected to serve as a brief reference guide for physiotherapists and instructors, guiding the growth of evidence-based approaches and procedures in managing the patients in several situations. On the other hand, it is acknowledged that further investigation is necessary to achieve a more extensive understanding of long term effects.

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