

Review Article

# Effects of Physiotherapy Care in the Postoperative of Total Hip Arthroplasty: An Integrative Review

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## Abstract

**Introduction:** Total hip arthroplasty is a procedure widely performed in orthopedics, as it is capable of restoring function in the hips, severely affected by orthopedic diseases, such as osteoarthritis and consequently reducing pain and restoring function.

**Objective:** To identify the effects of physical therapy in the postoperative period of total hip arthroplasty.

**Method:** This is an integrative review, of an exploratory and descriptive nature, carried out between January and May 2024 and guided by the recommendations of the Joanna Brigs Institute. The Pubmed, LILACS, and SciELO databases were used. The following descriptors were used for the search procedure: "Physiotherapy and hip arthroplasty". For the operationalization of the search, the Boolean descriptor "AND" was used to cross the descriptors. Articles were included in randomized clinical trials, published in full, without restriction of language and/or year of publication, which dealt with the theme addressed and that responded to the objective of the study. On the other hand, editorial letters, any type of literature review, articles unavailable at the time of search, abstracts and/or full articles published in annals of scientific events, preprints, and articles without abstracts were excluded.

**Results:** After searches in the databases, 108 articles were identified on the platforms, subsequently, all had their titles and abstracts read, then 58 articles were excluded for not meeting the eligibility criteria, leaving 50 articles carefully read in full, after complete reading, only 7 articles composed the final sample.

**Final considerations:** based on the reading and analysis of the articles that were previously selected, it was observed that there is no pre-established protocol among the authors for the postoperative period of hip arthroplasty, but that physical therapy techniques associated with therapist support and an early start are responsible for improving functionality, quality of life, pain reduction and increased muscle strength.

## Introduction

The hip joint plays a crucial role in hip mobility and functionality, allowing for a wide range of motion [1]. However, osteoarthritis of the hip, a progressive degenerative condition of cartilage, can result in chronic pain and limitations in Range of Motion (ROM). This condition predominantly affects women over the age of 40 and can be triggered by several factors, such as trauma, necrosis of the femoral head, and rheumatic diseases [1,2].

In advanced stages of osteoarthritis, surgical treatment becomes an option, taking into account various aspects such as age, underlying cause, activities to be performed, and bilateral condition. Among surgical procedures, Total Hip Arthroplasty (THA) stands out as an effective approach to improving quality of life by reducing pain and restoring joint function [3].

The significant increase in indications for THA, evidenced by a 40% increase by the year 2021, highlights the growing relevance of this procedure, especially in view of the increase

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in life expectancy of the population [2]. This trend implies additional challenges, such as the more frequent occurrence of femoral neck fractures, indicating a higher burden of chronic degenerative diseases in the elderly population [3].

The urgent need to understand the impacts of physical therapy on postoperative rehabilitation programs for Total Hip Arthroplasty (THA) underlies the rationale for this study [3]. The significant increase in indications for THA, especially in view of the increasing incidence of hip osteoarthritis in women over 40 years of age, highlights the importance of thoroughly investigating how physical therapy can positively influence the functional recovery and quality of life of patients undergoing this procedure [4].

The clinical relevance of this study transcends the specific approach of physical therapy, achieving the formulation of more effective rehabilitation guidelines and strategies. The intrinsic connection between research and the improvement of quality of life after THA is highlighted by the search to identify physical therapy practices that can be optimized, adapted, or expanded. Therefore, this study not only fills gaps in scientific knowledge but also offers essential subsidies to improve therapeutic interventions, promoting a more efficient and complete recovery for patients undergoing THA.

In the postoperative period of THA, physical therapy plays a crucial role in promoting functional recovery [5,6]. This study aims to identify, through an integrative literature review, the effects of physical therapy in rehabilitation programs in the postoperative period of total hip arthroplasty. By addressing this topic, we seek to contribute to the advancement of the state of the art, better understanding the benefits and impacts of physiotherapy in this specific context.

## Materials and methods

The present research adopts the integrative approach of literature review, characterized by its exploratory and descriptive character. It was carried out between January and May 2014. It is noteworthy that this method provides the search, critical evaluation, and synthesis of the available evidence on the investigated topic, culminating in the delineation of the current state of knowledge and in the identification of gaps that may raise future investigations [7]. The study was conducted from January to March 2024, following the guidelines of the Joanna Briggs Institute [8,9].

The methodology used followed the steps recommended by the institute, namely: identification of the guiding question, search in the literature, and collection and analysis of the data obtained. Initially, to guide the review, the PCC strategy was adopted (population [individuals in the postoperative period of total hip arthroplasty], context [clinics, hospitals, and health centers in general], and concept [Effects of physical therapy care]), culminating in the formulation of the following guiding question: "What are the effects provided by physical

therapy care to individuals in the postoperative period of total hip arthroplasty?"

The inclusion criteria included randomized clinical trials, fully published, without restrictions of language or year of publication, that addressed the theme in question. On the other hand, editorial letters, literature reviews, unavailable articles, abstracts in scientific events, preprints, and articles without abstracts were excluded. The search for articles was performed in the PubMed, LILACS, and SciELO databases, using the descriptors "Physiotherapy" and "hip arthroplasty", connected by the boolean operator "AND".

The initial procedure involved searching the databases with the strategy adopted. Subsequently, the identified articles were submitted to duplicity analysis, followed by the reading of titles and abstracts. Articles that met the eligibility criteria were selected for the subsequent phase, which consisted of the full analysis and determination of inclusion in the final sample.

## Results

After the searches in the databases, a total of 108 articles were identified on the platforms, subsequently, all had their titles and abstracts read, then 58 articles were excluded for not meeting the eligibility criteria (inclusion and exclusion criteria), leaving 50 articles that were carefully read in full, after complete reading, only 7 articles made up the final sample. The characterization of the sample can be seen in Tables 1,2.

## Discussion

After reading the selected articles, it was noticed that there was no consensus regarding the physical therapy protocols to be used in the postoperative period of hip arthroplasty. Among the 7 selected articles, the main clinical effects observed in the evaluated protocols were: improved functionality, quality of life, pain reduction, and increased muscle strength.

However, in this review, we observed that there is a need for standardization regarding the type of intervention,

**Table 1:** Description of the characteristics of the articles included in terms of authors, year, country, design, and journal of the publication.

Authors (year)	Country	Study design	Journal
Musumeci, et al. [13]	Brazil	Randomized clinical trial	International Journal of Biometeorology
Coulter, et al. [10]	Brazil	Randomized clinical trial	Archives of Physical Medicine and Rehabilitation
Busato, et al. [14]	Brazil	Randomized clinical trial	Physical Medicine and Rehabilitation
Villafañe, et al.[18]	Espanha	Randomized clinical trial	The Journal of Chiropractic Medicine
Okoro, et al. [11]	Italy	Randomized clinical trial	BMC Musculoskeletal Disord
Judd, et al. [12]	Espanha	Randomized clinical trial	Clinical biomechanics (Bristol, Avon)
Nakanowatari, et al. [15]	Italy	Randomized clinical trial	Physical Therapy Research

**Table 2:** Characteristics of the intervention and participants of the included articles.

Authors (year)	Sample/population	Objective	Main results
Musumeci, et al. [13]	12 participants aged 50-85 years (both genders)	To evaluate the feasibility and efficacy of an intensive physical therapy rehabilitation program after total hip arthroplasty in an Italian spa center.	After THA, patients undergoing an intensive post-acute multimodal rehabilitation program showed improvement in motor and functional recovery and a positive impact on quality of life.
Coulter, et al. [10]	98 participants aged 42-56 years (both genders)	To determine whether patients in the postoperative period of THA do better with unsupervised (home-based) or outpatient physical therapy.	Clinical and statistically similar results, independent of supervision. In addition, there are positive results regarding unsupervised early rehabilitation programs at home for low-risk patients who were discharged from the hospital after THA.
Busato, et al. [14]	51 participants aged 56-60 years (both genders)	To compare the efficacy of physical therapy in the postoperative period of THA added to a standard early care protocol.	Physical therapy sessions in the postoperative period of THA are able to significantly improve several functional outcomes when compared to the usual treatment after THA.
Villafañe, et al. [18]	24 participants aged 60-84 years (both genders)	To investigate the efficacy of action observation therapy (AOT) compared to written information in patients undergoing a physical therapy program after early total hip arthroplasty (THA).	Both treatments were effective in improving pain, functional status, quality of life, and gait characteristics in patients with primary THA. In addition to conventional physical therapy, AOT improved perceived physical function more than written information.
Okoro, et al. [11]	49 participants aged 56-74 years (both genders)	To evaluate whether a home-based progressive resistance training (TRP) program would be beneficial for improving patients' muscle strength postoperatively compared to standard rehabilitation.	It demonstrates that home-based PRT is feasible and well tolerated by patients immediately after (THA) and is effective, but not better than standard rehabilitation for improving physical function.
Judd, et al. [12]	5 participants aged 53-69 years (both genders)	To evaluate the effects of neuromuscular reeducation on hip mechanics (MRI) and functional performance in patients after total hip arthroplasty.	This study demonstrated that MRI techniques as part of a postoperative THA rehabilitation program provided effects on biomechanical, functional, performance, and muscle strength outcomes.
Nakanowatari, et al. [15]	33 participants aged 50-78 years (both genders)	To verify the specific exercise approach or modifiable heel raise in the treatment of functional leg length discrepancy in patients hospitalized in the early postoperative period after total hip arthroplasty.	The study made it possible to show that early physical therapy and multidisciplinary care in the postoperative period of THA are effective in significant functional gains.

frequency, and duration of rehabilitation protocols after hip arthroplasty. In addition, we were able to observe that there were no significant differences in the results between the interventions performed in offices and clinics, and the activities performed at home, indicating that it would be beneficial and safe for patients to recommend the practice of a complementary exercise protocol by the physiotherapists who accompany them.

This home-based practice was observed in the supervised versus unsupervised rehabilitation process in 98 individuals who qualified for the THA postoperative rehabilitation program. There were no statistically significant differences in these individuals between the groups that performed the program in a supervised manner and the group that performed the program independently [10].

Therefore, the study by Coulter, et al. [10] points out that by raising awareness, providing adequate guidance to the patient, and offering professional support according to the individual's degree of commitment, it is possible to reduce the costs of physiotherapy sessions by offering greater independence for the patient to perform the exercises on their own at home.

The findings obtained in a study conducted with 49 individuals after THA corroborate the above results, in which the rehabilitation program at home was as effective as the program performed in a supervised manner. The study also found significantly higher values for range of motion gain in the supervised group when compared to the control group [11].

These results were also shown to be effective in home

protocols, where it was possible to observe the tolerance of patients immediately after surgical arthroplasty (THA), showing that home proposals can be effective<sup>11</sup>. Joint mobilization and exercises in this group began on the same day of the surgical intervention, with intensive exercises and goals established daily, totaling eight hours per day. At the end of the study, it was noted that the accelerated intervention was more cost-effective than the standard intervention when implemented after total hip arthroplasty [12]. These findings may indicate a shorter duration of the rehabilitation process and an optimization of work teams.

This rehabilitation process is commonly carried out in settings such as hospitals, outpatient clinics, and at home. However, Musumeci, et al. [13] proposed the use of a multimodal thermal rehabilitation programme in association with a spa centre. Its findings demonstrated good results in relieving pain, improving motor and functional capacity, and improving the quality perceived by patients. The program consisted of six sessions with 2h30m, over two weeks. Of treatment, combining an educational program, hydrokinesiotherapy, and exercises on the ground with passive joint mobilization and functional training for two weeks [13].

Busato, et al. [14] presented evidence that pointed to a functional improvement in postoperative patients treated with manual therapy associated with the traditional physical therapy program. In that study, fascia manipulation was effective in reducing pain by increasing hip ROM movements and muscle capacity, along with the standard protocol. The protocol of this study established 2 daily sessions, which resulted in a tendency to reach functional milestones earlier



(such as independence in mobility and transfer), but did not result in a decrease in the length of hospital stay for early discharge.

In another study, it was examined whether the initiation of physical therapy on the day of surgery reduces the length of hospital stay without compromising functional results after total hip arthroplasty. The first group was recommended physiotherapy starting on the 1st postoperative day and basing the length of hospital stay at 4 days. The second group was indicated to start physical therapy treatment on the day of surgery with a 3-day stay. Both groups had the following clinical conducts: evaluation, posture change, bedside exercises, weight transfer, gait training, sitting and stair climbing training, strengthening, and guidance for the post-OP of hip arthroplasty [15].

It was found that physiotherapy, when applied early, results in a decrease in the length of hospital stay, thus reinforcing the evidence that early physiotherapy intervention is an important ally in the cost-benefit ratio of hospital admissions. This cost-benefit ratio and the precocity of the rehabilitation process can be influenced by the re-education of patients [15].

The application of exercises related to the use of steps associated with Neuromuscular Reeducation (NMR) in 10 individuals corroborates the findings described, by elucidating that MRI techniques as part of a postoperative THA rehabilitation program provided a positive effect on biomechanical results, performance, and muscle strength according to the author of the study [12].

Similar results were found in relation to the improvement of functionality in the studies conducted by Musumeci, et al. [13], where the intervention group associated kinesiotherapy, hydrokinesiotherapy, functional training, transcutaneous electrostimulation, interferential current, low-frequency laser, and educational program protocol. In this group, there was an improvement in functionality, a decrease in pain, and an improvement in quality of life.

Some studies have shown variations in their protocols, making it difficult to standardize the analysis of this review. As examples, we have works such as those by Busato, et al. [14] where a group that received myofascial release associated with the standard protocol showed decreased pain and increased functional capacity. Coulter, et al. [16] observed in their results that the control group showed greater recovery of hip abductor and knee extensor muscle strength than patients who received only conventional physical therapy. In addition, an improvement in patients who used MRI techniques as part of a postoperative THA rehabilitation program was found to have a positive effect on biomechanical outcomes, functional performance, and muscle strength [12].

Unlike most articles that reported clinical improvements and gains, some authors did not identify such gains. Brewster,

et al. [17] reported that in their treatment group there was an improvement in functional milestones on the 3<sup>rd</sup> day, although, after this period, there were no clinically significant results and no resulting improvement in the functional condition evolution on the 6<sup>th</sup> day, nor a reduction in treatment time.

Other authors, such as Coulter, et al. [10] report that in their supervised group there was strength training for the hip muscles, functional training, and gait training, and in the unsupervised group, strengthening of the hip muscles, CORE, and active mobilization of the ankle quadriceps, there was no difference between the groups for any measure.

Finally, Villafañe, et al. [18] described that of their groups, the group undergoing THA was the one that had an improvement in perceived physical function more than the information written in patients in the THA group. However, no significant differences were found in pain, hip ROM, functionality, or gait.

That said, the low methodological quality of the studies, lack of agreement among the authors regarding the prescription of physical therapy, and the number of articles were limitations of the study, which may be confounding factors and consequently generate a bias in the outcome. Professional support from the therapist and home-based protocols can be important in the rehabilitation process, promoting a reduction in patient expenses and access to effective and quality treatment.

## Conclusion

Based on the analyzed articles, early intervention in rehabilitation significantly enhances functionality, reduces pain, and improves quality of life. No single protocol stands out as universally effective; instead, a combination of individualized physical therapy techniques tailored to the patient's needs is crucial. Therapists should consider patient-specific factors and complaints when prescribing postoperative rehabilitation for total hip arthroplasty, ensuring that frequency, duration, periodicity, and repetition are well-defined, addressing the noted inconsistency in protocol standardization. Home protocol programs, supported by therapists, can aid in functional rehabilitation but should not replace professional supervision due to insufficient evidence of their standalone efficacy.

Future studies should focus on optimizing physical therapy prescriptions and evaluating the benefits of home protocols to establish robust scientific evidence. Further research is needed to support the efficacy of home-based rehabilitation programs and to determine whether they can effectively complement or even replace in-person sessions with trained professionals.

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