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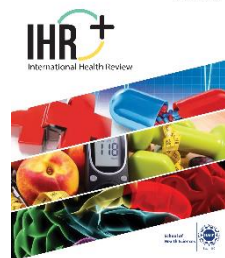
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# Comparing Prognosis of Hip Replacement Outcomes with and without Post-Operative Physiotherapy Sessions: A Five-Year Retrospective Review (2018-2022)

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## ABSTRACT

The hip joint is a ball and socket joint that supports body weight and is responsible for locomotion. Hip replacement surgery is mostly performed when hip pain significantly impedes daily life activities and when non-surgical treatments are ineffective in certain cases. The most common cause of hip replacement is damaged hip joint, which can cause arthritis. Therefore, physical therapy after the replacement surgery of major joints is generally considered helpful for a good prognosis. However, if the patients are given the usual care recommended by the surgeons, the patients recover in the same manner as they do with the physical therapy sessions or the physical therapy usually accelerates the recovery process and prevents future complications. Thus, the current study provides a comprehensive of the recovery of patients who have undergone hip arthroplasty, with or without physical therapy training programs.

**Keywords:** hip replacement, rehabilitation, surgery, total hip arthroplasty

## 1. INTRODUCTION

Reportedly in 2014, around 50,220 THA revisions were performed, which were predicted to increase from 2014-2030 by 43% - 70%, respectively. During this study period, the incidence of revisions increased in the age groups ranging from 55-74, however there was a significant decrease in the incidence of revisions in the age group of 75-84 years [1].

With the advancing benefits of physical therapy, interventions in the lifestyle, in terms of improvements, body fitness, pain reduction, increasing relaxation, prevention of certain diseases, and pre and post-operative recovery benefits, the literature from the last five years (2018-2022) was reviewed to find out whether physical therapy intervention has a conclusive benefit in patients who underwent total hip arthroplasty procedures or not.

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The databases used for the current research were PubMed, Google Scholar, Cochrane Library, and Pedro. The keywords used for research were hip arthroplasty, prognosis, physical therapy/physiotherapy, and recovery. Several studies were reviewed; however, the most recent studies were considered for the analysis (ranging from 2018-2022, which were based on physical therapy interventions' effect on post-operative THA patients. Moreover, studies, which were out of the scope or outdated were excluded from the considered selection. Furthermore, it was also highlighted that not much work has been done on the effect of physical therapy on post-operative THA patients considering the last five years' span.

For the analysis only 12 studies were included in this literature review, which met the eligibility criteria, 7 of them were systematic reviews, 2 were randomized control trials, 2 of them were feasibility studies, and 1 was an observational study. It was already notorious from the previous studies that post-operative physical therapy on THA patients has multiple benefits in increasing patients' functional mobility, ROM, ADLs, and prevention of contractures. However, physical therapy benefits were inconclusive regarding the patients or their usual care after the post-operative recovery of the patient. Considering the fact that physical therapy demands the investment of money and time as compared to usual care, it was undetermined whether physical therapy has beneficial and boosting effects on a patient's overall recovery or whether investing financial assets in physical therapy is worthwhile as compared to usual care.

Recent demographic trends in Pakistan suggest that there will be a substantial increase in hip replacement procedures in the forthcoming decades. Therefore, it is recommended that physical therapists working in Pakistan must perform post-operative rehabilitation on THA patients by preferring tele-rehabilitation over standard in-patient rehabilitation to get maximum benefits due to its cost-effectiveness [2].

Hence, the current study aims to conduct a systematic review of hip replacement procedures, to be conclusive about the fact and determine the effects of physical therapy on post-operative THA patients or if the usual post-operative care is enough.

One of the most essential joints in the human body is the hip joint, which connects your leg and your torso. Specifically, it is one of the largest and most flexible joints that allows the greatest ROM second to the shoulder

joint. It is made up of a thin bone (femur) and a hip bone (pelvis). Additionally, it appears like a ball-and-socket joint that supports the overall body weight and allows the movement of the upper leg. As the hip joint is one of the major lower extremity weight-bearing joints, it is more prone to osteoarthritis. However, any sort of damage to this joint is a complicated medical issue that can cause limited mobility, stiffness and chronic pain [3].

Normally, patients with end-stage arthritis of the hip joint may undergo a total hip replacement surgery to improve their mobility, restore their function, and relieve severe pain. This surgical procedure has significantly reached remarkable success and is now performed as a regular practice [4]. Primarily, two major noticeable causes of hip replacement are femoral head necrosis and hip osteoarthritis [5].

Apart from the two, hip osteoarthritis is the most prevalent indication for hip replacement surgery. Moreover, above all surgical interventions, total hip replacement has the exceptional ability to improve a patient's quality of life. Each year more than 1 million total hip arthroplasties are performed globally. The indications for total hip replacement are osteoarthritis, avascular necrosis, fractured neck of femur, inflammatory arthritis, and dysplasia. It was identified that multiple factors can lead to hip osteoarthritis including mechanical, biological, genetic, and environmental factors. Some risk factors related to the patients are age, trauma, joint morphology, and gender. An increasingly observed cause for Total Hip Replacement (THR) is femoro-acetabular impingement [4].

The prevalence of osteoarthritis has risen globally as people grow old. The majority of the patients are getting THR ranging from 61-76, with an average age of 69 years. However, it has been reported that the proportion of younger patients receiving THR is increasing in the USA and it has been predicted that by the year 2030, 52% of all the patients with THR will be younger than 65 years [4].

Reportedly, 30% of the elderly people that are above than 65 years are more prone to fall annually. Fractures are indirectly related to age factor, such as osteoporosis. Additionally, It was also identified that 87% of the hip fractures in geriatrics population, occur due to relapsing accidents [6]

Currently, there are multiple types of endo-prosthesis that are available for the hip and joint replacement. Resurfacing arthroplasty, total hip

replacement, and hemiarthroplasty are the potential surgical methods used after the identification of related-medical cases [3]. In this surgical method, a metal prosthesis, which is identical to a human joint or bone is placed into the impaired joint surface [7].

Traditionally, this method is mostly performed at elder people. Nevertheless, its impact is adversely affecting the younger people, who are attributed to the recent increased longevity and effectiveness of Total Hip Replacement (THR). However, this recently increasing longevity of THR is challenged due to osteolysis and wear of the weight-bearing surfaces [8].

Moreover, even after surgery, several challenges are faced by the patients to improve the prognosis [9]. Additionally, it was identified that after hip replacement, patients with hip dysplasia showed worse physical and functional recovery [10].

After THR, many post-operative deficiencies were immensely experienced by the patients who have undergone the surgical procedure. Some of these include reduction in stride length, walking distance, flexion and extension of the hip, walking speed, external rotation, and abduction [11].

Stable posture is a very significant component in performing daily life activities and the ability to sustain posture [12]. After surgery, patients may face an unbalance or disturbed walk due to surgical weakness, especially in the elder patients, which can lead to a relapsing situation[13]. Hence, in order to reduce the relapsing factor and return to functional activities, balance training is mostly recommended for THR patients [14]. Additionally, it was also identified that patients already had reduced muscle strength years before surgery [15].

Subsequent to the surgery, a designated timeframe exists during which patient's range of motion (ROM) can be restored in the newly replaced joint. However, if patient does not engage in physical therapy and mobility, scar tissue can form which will ultimately weaken the muscles and restrict joint movement. Physical therapy and mobility will help in preventing further complications, as well as, thromboembolism [16].

An essential part of care progression involves rehabilitation after THR surgery. It helps in the patient's rapid recovery by increasing their functional mobility [17]. Self-sufficiency, social and physical recovery, safe transfers, safe walking, and return to ADLs are the main aims of

rehabilitation [6]. The most significant outcome measure for patients who underwent THR is the successful return to their normal daily life activities [18].

In order to prevent chronic pain and rapid physical recovery, it is necessary to implement effective post-operative pain management[19]. After THR, physical therapy has been a common part of rehabilitation procedures [20]. Rehabilitation sessions can consist of conventional physical therapy, gait training, stair climbing, balance training, active ROM, functional exercises such as strengthening and ergometer cycling etc. [3].

Significantly, as indicated in previous studies these supervised rehabilitation programs are cost-effective. In consequence, these programs have a low rate of adherence, especially for people who lack personal transportation and who live in remote areas [21]. Nevertheless, these rehabilitation sessions lead to a better prognosis and a better possibility of returning to pre-existing ADLs [22].

Numerous studies have indicated that periprosthetic bone rehabilitation is crucial to increase the recovery process [23]. Usually, after getting a hospital discharge right after a hip replacement surgery, physical therapy rehabilitation is advantageous, however, it is not easy to access rehabilitation for some patients [24]. Rehabilitation can be difficult to access after surgery for some patients, payers and providers due to the financial burden [25].

## 2. LITERATURE REVIEW

A study highlighted the effectiveness of exercise for patients who underwent total hip replacement (THR) for increasing their functional capabilities in a meta-analysis and systematic review. The data on functional outcomes of exercise on THA patients was collected from Google databases, the Cochrane Database of Systematic Reviews, PubMed, Web of Science, and EMBASE. A total number of 10 studies were included with 441 patients in this meta-analysis. The exercise group as compared with the control group was associated with an increase in walking speed of 0.15 m/s over the control group (weighted mean difference [WMD] 0.15; with 95% confidence interval [CI] 0.08, 0.22;  $p = 0.000$ ). Additionally, the exercise group increased Harris hip score (WMD 8.49; 95% CI 5.19, 11.78;  $p = 0.000$ ) and abduction strength as compared to the control group (WMD 9.75; 95% CI 5.33,  $p = 0.000$ ). Furthermore, it was identified that exercise played a

beneficial role in reducing pain score (WMD -1.32; 95% CI -2.07, -0.57;  $p = 0.001$ ) and hospital stay tenure (WMD -0.68, 95 %CI -1.07, -0.29). increase;  $p = .001$ ) than the control group. In both cases there was no significant difference between physical activity measures (WMD -2.13; 95% CI -6.31, 2.05;  $p = 0.317$ ). Hence, it was concluded that in the management of total hip arthroplasty (THA), post-surgery physical therapy exercise group had better clinical outcomes and pain relief as compared to the control group. Hence, as an mediating factor, patients with THA were encouraged to actively engage in exercise [26].

A study based on the advantages of rehabilitation and physical activity in elder patients after undergoing knee and hip arthroplasty reviewed several research and systematic review articles, which were searched by using online databases, such as PubMed, Cochrane library, and Google Scholar. Moreover, this study considered all the studies available related to post-surgical physical activity and rehabilitation in patients who were older than 65 years and who underwent total knee and hip arthroplasty. From the search, total 744 papers were found, however, after careful selection and considering all the eligibility criteria, 22 articles were included in the study. It was concluded in this systematic review that the patients having age more than 65 years benefited in terms of muscle strength, functional activity, mobility, and achieving symmetrical gait from the physical therapy sessions, such as ergometer cycling, aquatic therapy, and fast-track protocols after knee and hip arthroplasty. However, the results of physical activity on implant survival and revision rate are debatable [27].

Another study, analyzed the search of the last 30 years' articles and identified 2447 publications, among them only 490 were relevant to their study. The results of the research revealed that rehabilitation and physical therapy after total hip replacement are as crucial as the surgery. It was further cultivated that the main aim of physical therapy and rehabilitation after THR is to reduce pain, increase muscle strength and movement, restore function, and recover ROM in the hip joint, which is vital for daily life activities. Hence, it was highlighted that gaining normal gait, being functional, economic, and in all respects achieving better quality of life. This article further stated that the best rehabilitation technique after THR is unknown. The rehabilitation strategy is adjusted according to the type of joint replacement procedure utilized in the treatment. Some authors suggested that training with partial body-weight support with treadmill plus

usual physical therapy exercise program helps to gain more normal gait in patients following THR. Though some authors encouraged the addition of ergometer cycling in the protocol of standard rehabilitation. Some put forward the significance of functional exercises (active range of motion, stair climbing, strengthening, gait training, and balancing). Overall, the article emphasized the increased prognosis of hip replacement with post-operative rehabilitation and physical therapy sessions [3].

Significantly, another systematic review article based on the rehabilitation of patients with physical therapy after endo prosthetic joint reconstruction of the lower extremity's major joints. This article was based on systematically analyzed studies in which 241 studies were selected from 2000-2018. Primarily, these studies focused on the use of physical and rehabilitation medicine (PRM) technologies and physical therapy exercise programs on patients who underwent joint replacement procedures of the major joints of the lower extremities. The results showed that in the last decade, a lot of studies were related to the lower extremity's major joints' endo-prosthetic replacement. However, several PRM technologies-based studies, suggested that physical therapy exercises combined with cryotherapy, kinesiotherapy, pressure therapy, and electrical stimulation have an effective impact on the prevention of post-surgical complications, such as thromboembolism [28].

A randomized controlled trial was conducted to assess a Physiotherapy-guided functional exercise program in post-operative patients after undergoing total hip arthroplasty (THA). The subjects were recruited from pre-operative assessment clinic. A total sample size of 63(Sixty-three) participants was used in this study. After randomization 31 subjects were allocated in the first group called control group and 32 subjects were allocated in the second group called PT exercise group. This is a single blinding randomization RCT in which assessor was blinded. Patients with total hip replacement, who were designated in the PT exercise group were facilitated with supervised physical therapy (functional exercises) from 12-18 weeks done twice a week, while patients with total hip arthroplasty in the control group were given the protocol of regular care with no physical therapy treatment. The effect measures or outcome measures used in this study were physical and mental health scores. At the start of the study, there was not much difference between the control and functional group. A duration of 18 weeks after surgery, PT exercise group walking speed, and



WOMAC function [Average difference -4.0, 95% confidence interval (CI) -7.0 to 1.0 ( $p < 0.01$ ); average difference 21.9 m, 95% CI 0.60 ~ 43.3 ( $p < 0.04$ )] was significantly improved as compared to the control group. The P-values ( $p < 0.01$ ) and ( $p < 0.04$ ) between the groups were less than 0.05, indicating that there is a significant difference between the contrasting group and the PT movement group. This study showed that the subjects who belonged to the PT exercise group gained significant pain relief, an increased quality of life, and functional improvement as compared to the subjects, who belonged to the usual care control group [20].

A significant study based on the differences in physical activity after total knee or hip replacement is a meta-analysis and systematic review of post-surgical physical activity results at 6 and 12 months. No intervention was given to the subjects, and patients were simply observed. A sample size of 336 participants (from seven studies) met the eligibility criteria. Additionally, it was found that no notable improvement in the physical activity was noticed at 6 months post-surgery (SMD 0.14 [ $I^2 = 0\%$ , 95% confidence interval (95% CI) -0.05, 0.34]) and a little or moderately notable effect in physical activity was noticed at 12 months (SMD 0.43 [ $I^2 = 0\%$ , 95% CI 0.22, 0.64]). The results of this study put forward that at 6 months post-surgery, physical activity did not change much. However, a small or moderate improvement was noticed in the physical activity at 12 months post-surgery. The reason behind the decreased improvement in the physical activity post-surgery, might be related to the sedentary lifestyle or inactivity [29].

An observational study based on the levels of physical activity after the knee joint and hip joint arthroplasty was conducted. In this study, a number of 79 subjects were specified to an exercise group for 6 weeks after total knee or hip replacement. These participants were assessed by the use of the International Physical Activity Questionnaire (IPAQ). All the outcome measures or effect measures were evaluated at three different stages during the research at entry, at discharge, and at 6 weeks after the discharge. A total number of 54 subjects completed the study. The performance of the patients receiving exercise after the total hip or knee replacement was significantly improved 6 weeks after the discharge [30].

A study based on the continuing rehabilitation after total hip replacement was conducted. A total number of 20 subjects were included in the study. A sample size of 10 patients were allocated in the control group

and 10 patients were allocated in the experimental group. In the experimental group the exercise sessions were administered by the therapist in early phase after the surgery from 0-12 weeks, however, in the later phase of surgery from 12-16 weeks, high-level and progressive retraining was followed, which was also administered by the therapist. Exercise training plan was made according to the specific patient's needs. In the control groups the patients were given the regular care advised by their specific surgeons. Many different outcome measures were used in the study, which includes Stair Climb Test (SCT), Thirty Second Chair Rise Test (30-CRT), the Hip Dysfunction, and Osteoarthritis Outcome Score for Joint Replacement (HOOS Jr), and sit to stand ground reaction force, which were compared between the control and experimental groups. From the control group one subject dropped out before the treatment. The experimental group had notably increased improvement than the control group ( $p = 0.011$ ). In conclusion the patients belonged to the physical therapy intervention group had improvements in overall biomechanics and physical functioning [31].

A significant research based on the rehabilitation training in patients with proprioception and balance impairment following total hip replacement is a systematic review. In this systematic review, 41 studies were added from which 33 studies were related to the assessment of proprioception and balance and 8 studies were related to training. Only 31 quality studies were considered for the analysis, while 2 studies were of average quality and 8 studies were of low quality. In the literature review, it was mentioned that balance training showed progressive improvement in patient's balance after total hip arthroplasty. After total hip replacement patient's balancing abnormalities can persist for up to 5 years after the operation and patients tend to be more prone to falling incidents. It was suggested that, if balancing training is specially made for increasing patient's balance and training is consistent then it can be very useful after the surgery. However, out of 41 studies, only 2 studies evaluated proprioception integrity in patients after total hip arthroplasty (THA). Hence, it was concluded in this study that although the evidence was not enough, nonetheless, the available studies suggested the idea that balance training showed improvement in patients' proprioception and balancing integrity and prevented the risk of falls and fractures. Further research regarding the proprioception impairment in patients after hip replacement surgery was also suggested [32].

Another significant article based on the increasing rehabilitation training program for elder and younger patients after total hip replacement was written. The aim of this study was to evaluate the safety, outcomes, and ease of a study which compares a six-week long rehabilitation program after THR surgery for the regular care of patients whose age was less than or equal to 60 years, and who underwent unilateral total hip arthroplasty (THA). In this study, 24 subjects with total hip replacement surgery were included during their post-surgical visit to surgeons after six weeks. A rehabilitation training program, which was community-based; was designed to increase patient activity and function. In this training program, land and water-based 12 exercises were structured for over six weeks. All the outcome measures in this study were also used, such as physical activity was evaluated using Sense Wear Pro Armband (SWA). The subjects accomplished the THA satisfaction questionnaire and Hip Osteoarthritis Outcome Score (HOOS) before and just after the treatment ended. A total number of 14 subjects were in the experimental group and received increased rehabilitation, while 10 subjects were included in the control group. In the treatment group, 80% of sessions were completed by the participants except one. At the follow-up, the experimental group comparatively took more steps/day (95% CI = 1678, 4712) ( $p < 0.05$ ), mean difference = 2440 steps/day) compared to the control group. The treatment group had more mean change physical activity bouts as compared to the control group. Also at the follow-up, the treatment group all the subscales of HOOS were relatively higher as compared to the treatment they had before. Hence, it was concluded from factual data obtained from this study that administrating an increased rehabilitation program after elective total hip arthroplasty has a positive impact on patient's physical activity and function [33].

Early rehabilitation on periprosthetic bone surrounding after hip replacement surgery is a randomized controlled trial. The aim of this study was to investigate whether early rehabilitation has any beneficial effect on periprosthetic bone surrounding after total hip replacement or to assess the benefit and safety of early activity after the surgery. In this study a number of 22 participants were included who underwent primary total hip replacement (THA) who were initially suffering from advance stage osteonecrosis of femoral head. The participants were randomly distributed by 1:1 to a low activity level group and high activity level group. The treatment plan was daily walking with different distances criteria for both

groups. Consequently, no adverse events were noted in both groups. However, high activity level group had more beneficial affect from stress protection than low activity level group. There was no statistical difference identified between both groups ( $p > 0.05$ ), however, the statistical difference ( $p < 0.05$ ) of stress protection was identified between the groups. Hence, it was concluded that early rehabilitation had beneficial effects in increasing the remodeling of periprosthetic bone and increased protection from stress with no relative functional improvement [34].

A meta-analysis and systematic review-based on the assessment of exercise treatments and results after the hip replacement was written. According to this research, a total of 32 RCTs with 1753 subjects were included in the qualitative analysis and 26 studies with 1004 subjects were included in the meta-analysis. In relation to the no or minimal intervention, or regular care, the post-surgery exercise coaching program was not related to any increase in physical activity (moderate level of certainty at 4 weeks (standardized mean difference [SMD], 0.01; 95% CI, -0.18 to 0.20), 12 weeks (SMD, -0.08; 95% CI, -0.23 to 0.07), and 26 weeks (SMD, -0.04; 95% CI, -0.31 to 0.24) post-surgically, and low level of certainty at 1 year after the surgical treatment (SMD, 0.01; 95% CI, -0.09 to 0.12) in the patients who underwent THA. Hence, it was found in this meta-analysis and systematic review that post-surgery exercise treatments are not directly linked to increased physical activity when compared to minimal or no intervention, or usual care. Furthermore, this paper suggested that post-surgery exercise sessions are probably not necessarily important for patients with THA [35].

**Table 1.** Outline of the Studies Included

Sr #	Studies	Results	References
1	Effectiveness of exercise for the patients who underwent total hip replacement for increasing their functional capabilities	Management of total hip arthroplasty, post-surgery physical therapy exercise group had better clinical outcomes and pain relief as compared to the control group. It was encouraged to use exercise for patients with THA.	Wu, Mao et al. 2019 [26]

Sr #	Studies	Results	References
2	Advantages of rehabilitation and physical activity in elderly patients after knee and hip arthroplasty	The patients over the age of 65 years benefit in terms of muscle strength, functional activity, mobility and achieving symmetrical gait from the physical therapy sessions such as ergometer cycling, aquatic therapy and fast-track protocols after knee and hip arthroplasty. However, the result of physical activity on implant survival and revision rate is debatable.	Papalia, Campi et al. 2020 [27]
3	Total hip replacement rehabilitation: results and dilemmas	The whole article emphasis on the increased prognosis of hip replacement with post-operative rehabilitation and physical therapy sessions.	Spalevic, Milenkovic et al. 2018 [3]
4	Rehabilitation of patients with physical therapy after endo prosthetic joint reconstruction of lower extremity's major joints (systematic review)	Some studies were based on the PRM technologies, suggested that physical therapy exercises combined with cryotherapy, kinesiotherapy, pressure therapy and electrical stimulation has the proven effect in the prevention of post-surgical complication such as thromboembolism.	Khoziainov, Kovlen et al. 2019 [28]
5	Physiotherapy-guided functional exercise program in postoperative patients after total hip arthroplasty	This study shows that the subjects who belonged to the PT exercise group gained significant pain relief, increased quality of life and functional improvement as compared to the subjects that	Monaghan, Cunningham et al. 2018 [20]

Sr #	Studies	Results	References
		belonged to the usual care control group.	
6	Differences in physical activity after total knee or hip replacement	The results of this study put forward that at 6 months post-surgery, physical activity was not changed much.	Hammett, Simonian et al. 2018 [29]
7	Levels of physical activity after the knee joint and hip joint arthroplasty	Performance of the patients receiving exercise after Total hip or knee replacement was significantly improved at 6-weeks after discharge.	Hawke, Sheilds et al. 2019 [30]
8	The continuing rehabilitation after total hip replacement	In conclusion the physical therapy intervention group had improvements in overall patient's biomechanics and physical functioning.	Madara, Marmon et al. 2019 [31]
9	Rehabilitation training in patients with proprioception and balance impairment following total hip replacement	It was concluded that although the evidence was not enough but the available studies suggested the idea that balance training showed improvement in patient's proprioception and balancing integrity and prevent the risk of falls and fractures.	Labanca, Ciardulli et al. 2021 [32]
10	Increasing rehabilitation training program for elderly and younger patients after total hip replacement	It was concluded from factual data obtained from this study that administrating an increased rehabilitation program after elective total hip arthroplasty has a positive impact on patient's physical activity and function.	Negm, Yavarai et al. 2022 [33]
11	Effect of early rehabilitation on periprosthetic bone	It was concluded that early rehabilitation had beneficial effects in increasing the	Su, Feng et al. 2021

Sr #	Studies	Results	References
	surrounding after hip replacement surgery	remodeling of periprosthetic bone and increased protection from stress with no relative functional improvement.	[34]
12	Review based on the assessment of exercise treatments and results after hip replacement	This paper suggests that post-surgery exercise sessions are probably not important for patients with THA.	Saueressig, Owen et al. 2021 [35]

### 3. DISCUSSION

Table. 1 suggests a clear consensus in favour of post-surgery physical therapy and rehabilitation for patients undergoing total hip arthroplasty (THA). Multiple studies cited in the text consistently indicated that patients who participated in the physical therapy exercise groups experienced better clinical outcomes, pain relief, improved muscle strength, functional activity, mobility, and quality of life as compared to control groups receiving usual care. Furthermore, it appears that early rehabilitation may have positive effects on periprosthetic bone remodeling and protection from stress, although it may not lead to significant functional improvement according to the studies in Table 1. Additionally, there is evidence that physical therapy interventions can help prevent post-surgical complications such as thromboembolism.

However, it's worth noting that the conflicting statement at the end of Table.1 suggests post-surgery exercise sessions, which may not be important for THA patients. This contradicts the consistent findings from previous studies, which may be an outlier or not representative of the broader body of research concerning the current topic. Overall, the majority of the evidence presented in this study emphasized the importance of post-operative rehabilitation and physical therapy sessions in improving the prognosis and quality of life for patients undergoing hip arthroplasty, particularly for elders over the age of 65.

#### 3.1. Conclusion

Prevailing consensus among most of the prior studies suggested that the prognosis of hip replacement with post-operative physical therapy sessions is much better as compared to no physical therapy session. However, one

significant study negated this idea and suggested that post-operative physical therapy sessions are not necessarily required for patients with hip replacement; as exercise interventions are not related to the increased physical function after the surgery as compared to the usual care. Since most of the literature supported the proposal of increased prognosis of hip replacement with post-operative physical therapy sessions, it was concluded that physical therapy is worthwhile in increasing post-operative THA patients' recovery and functional capabilities.

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