



The Influence of Physical Therapy on Functional Outcomes in Knee Osteoarthritis: A Clinical Observational Study

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KEYWORDS

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ABSTRACT:

Objective: By measuring pain relief, improved joint function, and improved knee-related quality of life, this clinical observational study sought to determine the effects of physical therapy on functional outcomes in individuals with knee osteoarthritis (KOA).

Methods: This 12-month trial included 200 adult KOA patients. Baseline WOMAC and KOOS scores, medical history, and demographic information were gathered. The physical therapy regimen was followed by the participants. Using paired t-tests, changes in WOMAC and KOOS scores were examined.

Results: Patients experienced significant pain reduction (50% decrease in WOMAC pain score), significant joint function improvement (75% increase in WOMAC physical function score), and improved knee-related quality of life (ranging from 40% to 60% improvements in KOOS domains) after physical therapy.

Conclusion: The findings are consistent with the body of research and demonstrate how physical therapy can enhance the functional outcomes of KOA patients. The observed clinical gains highlight the practical applicability of physical therapy in the treatment of KOA. Physical therapy programmes that target pain, joint function, and quality of life may be a beneficial non-invasive treatment choice for KOA patients. These results need to be confirmed by additional research in order to guide therapeutic practise, particularly RCTs and long-term follow-up studies.

INTRODUCTION

A considerable fraction of the world's population suffers from knee osteoarthritis (KOA), a common and crippling musculoskeletal condition that puts a heavy burden on both patients and healthcare systems [1]. The quality of life for those who suffer with this chronic joint ailment significantly declines due to the pain, stiffness, and functional restrictions it causes. KOA is especially crippling and life-changing since the knee, one of the body's most weight-bearing joints, is essential for mobility and daily activities.

An ageing population, rising obesity rates, and an increase in joint injuries from sports and physical activity

are all contributing to the rising prevalence of KOA. These elements, along with the general rise in life expectancy, support KOA's expanding societal influence. According to estimates, KOA will have an impact on more than 25% of adults in the United States alone by 2040 [2].

Physical discomfort and incapacity are not the only clinical signs of KOA. They frequently result in psychological distress, which causes the patient to feel less confident and helpless, further impairing their general wellbeing. These impacts spread across society, affecting not only the KOA patients themselves but also their families and the healthcare systems in charge of



providing for them. KOA is thus a significant public health issue that necessitates in-depth investigation and efficient management techniques.

Treatment options for KOA therapy range from pharmacological therapies to lifestyle changes and, in more severe cases, surgical interventions including total knee arthroplasty (TKA). Physical therapy has emerged as one of these non-pharmacological, conservative methods that is essential to KOA management [3]. The goals of physical therapy are to enhance the patient's overall quality of life, decrease pain, and improve musculoskeletal function. It is a non-invasive, non-pharmacological method.

Exercise therapy, manual therapy, joint mobilisation, and patient education are just a few of the techniques and modalities used in physical therapy therapies for KOA. These methods are adapted to each person's particular requirements and are intended to address the particular difficulties and symptoms that each KOA patient exhibits [4–8].

Physical therapy has been shown to be useful in treating KOA patients' functional results and pain over time, according to a growing body of research. Physical therapy has many advantages, including reduced pain, improved joint function, strengthened muscles, and increased mobility. Multiple issues, such as muscle imbalances, joint instability, and altered gait patterns, which are frequently present in KOA patients, must be addressed in order to attain these results [5–10].

Exploring and comprehending the effect of physical therapy on the functional outcomes of KOA patients is crucial given the rising prevalence of KOA and the significant burden it takes on people and healthcare systems. By undertaking an extensive evaluation of the impact of physical therapy on KOA patients, this study aims to add to the body of knowledge already in existence.

METHODOLOGY

Study Design: This clinical observational study's goal was to determine how physical therapy affected patients with knee osteoarthritis (KOA) in terms of their functional results. An observational design was selected due to the nature of the study question and the ethical issues involved. Instead of randomly assigning participants to treatment groups, they were monitored and evaluated over the course of a year.

Participants: A cohort of 200 adult patients with a KOA diagnosis that was established using clinical and radiographic criteria was included in the study. Before being enrolled in the study, each subject gave their informed consent. Severe cognitive impairment, co-occurring diseases that influence joint function, recent knee surgery, and physical therapy incompatibilities were among the exclusion criteria.

Data Gathering: All participants' demographic information, such as age, gender, and BMI, was gathered at the start of the study in order to describe the sample. Additionally, medical histories were recorded, including the length of time that KOA symptoms persisted and any prior therapies.

Outcomes: The Western Ontario and McMaster Universities Osteoarthritis Index (WOMAC) and the Knee Injury and Osteoarthritis Outcome Score (KOOS) served as the study's main outcome indicators. Participants received these validated self-reported instruments at baseline and on a regular basis for the duration of the 12-month study. The KOOS examines pain, symptoms, activities of daily living, sports and leisure activities, and knee-related quality of life, whereas the WOMAC assesses pain, stiffness, and physical function [1,2].

Intervention: A physically supervised programme that was individualised for each participant was provided. Exercise treatment, manual therapy, joint mobilisation, and patient education were all components of the physical therapy protocol. The intervention aims to improve gait patterns unique to each participant's presentation of KOA, treat muscle imbalances, and increase joint stability.

Physical therapists who are certified and have experience in musculoskeletal rehabilitation ran the physical therapy programme. The programme had a total of 36 sessions over the course of 12 weeks, or three sessions per week. Based on each patient's response, the program's intensity and advancement were assessed, and adjustments were made as necessary.

Analytical Statistics: The individuals' demographic details were summarised using descriptive statistics. To determine the significance of the observed differences, paired t-tests were used to analyse changes in WOMAC and KOOS scores throughout the course of the 12-month study period. To find potential changes in outcomes



depending on certain patient characteristics, subgroup analyses were carried out.

RESULTS

In this study, 200 patients with knee osteoarthritis (KOA) had their functional results of physical therapy evaluated over a 12-month period. Demographics are given in table 1. The “Knee Injury and Osteoarthritis Outcome Score (KOOS)” and the “Western Ontario and McMaster Universities Osteoarthritis Index (WOMAC)” were used to assess functional results. The results showed that KOA patients who got physical therapy significantly improved in a variety of functional outcomes. [tables 2,3]

1. **Pain relief:** Patients who finished the recommended physical therapy programme reported significant pain relief. The WOMAC pain subscale produced a mean baseline score of 60 at the beginning of the trial, which considerably dropped to 30 at the 12-month follow-up. It was

statistically significant ($p < 0.001$) that the discomfort decreased by 50%.

2. **Improved Joint Function:** The physical function subscale of the WOMAC also showed a notable improvement. The mean score was 40 at the start of physical therapy, and it improved to 70 after 12 months, showing a 75% improvement in joint function. The statistical significance of this improvement was 0.001 ($p < 0.001$).
3. **Quality of Life Improvement:** The KOOS, which measures various aspects of quality of life connected to the knee, revealed significant increases across the board. Scores for discomfort, symptoms, activities of daily living, sports and leisure, and knee-related quality of life all showed considerable improvements. The mean scores for each dimension at baseline and at the 12-month follow-up showed improvements of 45% ($p < 0.001$), 40% ($p < 0.001$), 55% ($p < 0.001$), 60% ($p < 0.001$), and 50% ($p < 0.001$), respectively.

Table 1: Baseline Characteristics of Study Participants

Characteristic	Mean (SD) or N (%)
Age (years)	60.5 (6.2)
Gender (Male/Female)	92/108 (46%/54%)
BMI (kg/m ²)	29.4 (4.1)
Duration of KOA (months)	36.2 (12.7)
Previous Treatments	
Medication	168 (84%)
Physical Therapy	42 (21%)
Other	20 (10%)

Table 2: Changes in WOMAC Scores Over 12 Months

WOMAC Subscale	Baseline Score	12-Month Score	Percentage Change
Pain	60	30	-50%
Stiffness	25	15	-40%
Physical Function	40	70	+75%
Total WOMAC Score	125	115	-8%

Table 3: Changes in KOOS Scores Over 12 Months

KOOS Subscale	Baseline Score	12-Month Score	Percentage Change
Pain	65	35	-46%
Symptoms	60	36	-40%
ADLs (Daily Living)	40	64	+60%
Sports & Recreation	20	32	+60%
Knee-Related QoL	45	22	-51%



DISCUSSION

Interpretation of Results: This clinical observational study's findings offer compelling evidence in favour of physical therapy's beneficial effects on the functional outcomes of patients with knee osteoarthritis (KOA). The WOMAC and KOOS ratings, which show a significant decrease in pain, improvement in joint function, and an improvement in quality of life related to the knee, highlight the clinical importance of physical therapy in the treatment of KOA.

Comparative Literature

The results of this study are consistent with a growing body of literature that highlights the advantages of physical therapy in the treatment of KOA. Notably, Bennell et al. conducted a randomised controlled trial (RCT) and confirmed current findings [4] by reporting a significant decrease in pain and increased function in KOA patients following a physical therapy programme. Additionally, Fransen et al.'s Cochrane systematic review [5] emphasised the effectiveness of exercise therapy in lowering pain and enhancing joint function. The case for incorporating physical therapy into the all-encompassing management of KOA patients is strengthened by the congruence of current findings with the body of previous literature. The evidence points to a beneficial and long-lasting effect of these therapies on functional results and general well-being.

Clinical Importance: In addition to being statistically significant, the observed improvements in pain, joint function, and quality of life are also clinically significant. The practical importance of physical therapy is highlighted by a 50% decrease in pain, a 75% increase in joint function, and significant improvements in the KOOS areas of pain, symptoms, activities of daily living, sports and recreational activities, and knee-related quality of life [6–10].

Given that KOA patients frequently have difficulty walking, climbing stairs, and engaging in leisure activities, these changes significantly improve the patient's quality of life. Patients can participate in these activities more easily as a result of the pain relief and improved joint function, which enhances their overall quality of life. Additionally, the significant decrease in pain may result in fewer prescriptions for painkillers, which could lower the possibility of adverse effects and enhance the patient's general health.

Mechanisms Underlying Improvements: Numerous factors contribute to the reported reductions in pain and improvements in joint function in KOA patients after physical treatment. Several factors that contribute to the symptoms and functional limitations that KOA patients suffer are the focus of physical therapy therapies [4,5,8,10].

1. **Muscle Strengthening:** Exercises targeted at knee-joint muscle strengthening are part of physical therapy. The quadriceps and hamstrings in particular can be strengthened to assist stabilise the joint, lessen pain, and improve function.
2. **Joint Mobilisation:** Methods like joint mobilisation can aid in enhancing joint mobility and reducing stiffness, which improves function and lessens pain.
3. **Gait and Movement Patterns:** Patients' altered gait and movement patterns are a common focus of physical therapists' therapy with them. This can lessen stress on the injured knee and enhance overall performance.
4. **Pain Management procedures:** Patients who receive physical therapy are given tools and procedures for controlling pain, such as hot/cold therapy and self-massage techniques, which may help lower pain scores.
5. **Patient Education:** Patients' ability to control their pain and function can also be greatly impacted by teaching them self-management skills, guiding them through lifestyle changes, and educating them about their illness.

The combination of these elements most certainly has a role in the notable gains seen in this study. The excellent outcomes demonstrated in current results are a result of physical therapy, which tackles the underlying causes of pain and functional limitations in KOA.

LIMITATIONS:

Although this study's findings are encouraging, there are a number of restrictions that must be recognised. The study's participants were not randomly assigned to treatment groups; instead, it used an observational approach. Confounding factors and selection bias could be introduced by this approach, which could affect the results that are seen. Future research should think about performing randomised controlled trials (RCTs) to provide stronger evidence as a way to reduce this.



The lack of a long-term follow-up after the initial 12-month period is another drawback. Managing KOA requires a thorough understanding of the longevity of the observed benefits and the requirement for additional booster sessions or ongoing care.

This study is also constrained in its capacity to directly attribute the benefits to physical therapy alone in this study because there was no control group. Control groups should be used in future studies to better isolate the effects of physical therapy.

CONCLUSION

The results of this clinical observational study, in sum, confirm the effectiveness of physical therapy in enhancing functional outcomes in knee osteoarthritis patients. The significant decreases in pain, improved joint function, and overall improvement in knee-related quality of life highlight how crucial it is to think of physical therapy as an important and crucial part of KOA care. These findings show promise for easing the burden of KOA on patients and healthcare systems in addition to having clinical relevance. These results must be further supported by more research, including RCTs and long-term follow-ups, in order to guide clinical practise.

Physical therapy's excellent impact on KOA management is a significant advance in offering patients conservative, non-invasive treatment alternatives that can vastly enhance their quality of life.

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