

# The effect of exercise and physical activity on gait biomechanics and pain in people with knee osteoarthritis

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## Summary

The overarching aim of this project is to determine the effect of exercise on gait biomechanics and recommend exercise therapy to patients with knee osteoarthritis to provide long-term benefits in pain reduction, improving function and gait modifications.

## Introduction

Osteoarthritis is a common, debilitating musculoskeletal disorder, a leading cause of disability and major healthcare costs worldwide. Osteoarthritis of the knee is the most prevalent type of osteoarthritis affecting 5.4 million people in the UK leading to increasing healthcare costs. Exercise has been shown to help symptoms in people with knee osteoarthritis, however, there are unanswered questions about the effects of exercise on gait biomechanics.

## Methods

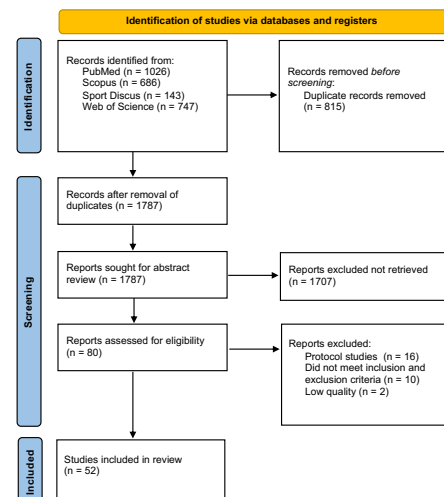
A systematic review of literature is carried out to provide an evaluation and review of current literature to determine the effects of physical activity and performance of specific exercises on gait characteristics and pain in people with knee osteoarthritis.

Studies published in English up to 31/01/2025 were retrieved from four electronic databases cross-referencing, and expert review. The primary outcome measures were changes in gait related characteristics including kinetics and kinematics. Secondary outcomes included changes in pain and mobility assessed through questionnaires such as Western Ontario and McMaster Universities Arthritis Index (WOMAC). This study was carried out to the standard set out by the preferred reporting items for systematic review and meta-analysis protocols (PRISMA-P) [1].

To include patient voice within this body of work, data obtained from this systematic review will then be used to develop a survey to establish types of exercise performed by the osteoarthritic patients and conduct randomised controlled clinical trials to determine the effect of exercise chosen from the systematic review and survey to reduce knee joint pain and provide stability during the gait.

## Results and Discussion

From the initial keyword search 2602 studies were identified out of which 52 studies were found to meet the criteria and had a Black and Downs score higher than 14 and have been included in the narrative synthesis. A summary of the studies included in the review is shown in Figure 1. From the initial 2602 studies across all databases 815 duplicates were removed. From initial abstract review and full text review 52 studies were selected for data extraction.



**Figure 1:** PRISMA flow diagram for systematic review.

The diagram shows the process undertaken to identify studies for the systematic review. Adapted from Page et al., 2021 [2].

## Conclusions

The findings of this research may form a basis for recommendations of physical activity interventions for the benefits of patients with knee osteoarthritis including pain reduction, mobility improvement and gait modification.

## References

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- [2] Page, M.J. et al. (2021). 'The PRISMA 2020 statement: An updated guideline for reporting systematic reviews'. *BMJ*. **372**: n71. doi: 10.1136/bmj.n71.