Title

Effectiveness of rehabilitation for osteoarthritis of the knee associated with isolated meniscus injury: a scoping review protocol

Authors

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Abstract

- **Objective:** The purpose of this scoping review is to examine whether there are differences in rehabilitation according to the degree of damage to the isolated medial and lateral meniscus and to determine whether it is of value to conduct a systematic review in the future.
- **Introduction:** The prevalence of meniscus injuries in middle-aged and elderly people (>50 years) is 31%, and they occur more frequently in medial meniscus injuries than in lateral meniscus injuries (28%＞12%). The treatment of meniscus injuries consists of conservative therapy and surgery, and the benefit of combining surgery with rehabilitation has become clear. However, the effectiveness of rehabilitation alone, according to the degree of isolated meniscus injury, has not been clarified.
- **Eligibility criteria:** The review will be a scoping review of the effectiveness of rehabilitation for osteoarthritis of the knee with unilateral or bilateral isolated meniscus injuries in patients over 40 years of age. Outcomes will be pain, function, and re-injury. All types of research will be accepted without restrictions as to location, race, gender, or language of the original article.
- **Methods:** A systematic search of PubMed, Cumulative Index to Nursing and Allied Health Literature (CINAHL), Web of Science, and Physiotherapy Evidence Database (PEDro) databases using the keywords "meniscus" and "physical therapy" will be conducted during September 2021. In addition, we will not limit the language of the search, in order to include all studies.
  Data extraction tools will be used to specifically show findings in extracted articles related to participants, concepts, context, research design, and review questions. Outcomes should be pain, function, and re-injury, and results should be specified for each outcome.

Introduction

The prevalence of meniscus injuries in middle-aged and elderly people (>50 years) is 31%, with more medial meniscus injuries than lateral meniscus injuries (28%＞12%), and the prevalence increases with age in both sexes [1-2].

Currently, the treatment of meniscus injuries is based on the algorithm that conservative therapies such as joint injections and rehabilitation are indicated at first, and when conservative therapies are ineffective, surgical treatment is indicated [3]. Rehabilitation, one of the conservative therapies, had shown no significant difference in a study comparing meniscectomy and rehabilitation with a two-year follow-up [4]. Meanwhile, rehabilitation for medial meniscus injuries had been shown to have short-term effects [5].

Surgical treatment is divided into meniscectomy and repair. It has been pointed out that meniscectomy contributes to early osteoarthritis of the knee, and repair is now indicated [6]. In addition, the importance of rehabilitation after resection and repair has also been demonstrated [7-9].

However, the effectiveness of rehabilitation alone, according to the degree of isolated injury in the medial and lateral meniscus, has not been clarified by articles in PubMed, the Cochrane Database of Systematic Reviews, the Joanna Briggs Institute (JBI) Evidence Synthesis, and the International Prospective Register of Systematic Reviews (PROSPERO), A preliminary search of protocols.io did not identify any current or ongoing systematic reviews or scoping reviews on this topic.

To date, no systematic or scoping reviews have been published that have investigated the benefit of rehabilitation alone, according to the degree of medial and lateral meniscus injury.

Review Question

The purpose of the scoping review is to examine whether there are differences in rehabilitation according to the degree of damage to the isolated medial and lateral meniscus, and to determine whether it is of value to conduct a systematic review in the future.

Keywords

Knee injuries; Meniscal; Physiotherapy; Exercise therapy

Eligibility Criteria

- Participants

The prevalence of knee osteoarthritis on MRI in uninjured, asymptomatic healthy knee had been reported to be as high as 43% in adults over 40 years of age [2]. In addition, the prevalence of symptomatic knee osteoarthritis peaks around the age of 50 years [10].

From this the target population is patients with osteoarthritis of the knee with unilateral or bilateral isolated meniscus injury, aged 40 years or older. Osteoarthritis of the knee is defined as a Kellgren & Lawrence (KL) grade of 0 to 4. Additionally, there are no gender restrictions.

The exclusion criteria are meniscus injuries in patients less than 39 years of age and meniscus injuries due to trauma caused by sports, as well as meniscus injuries associated with ligament injury (anterior cruciate ligament / posterior cruciate ligament / medial collateral ligament / lateral collateral ligament), cartilage loss associated with traumatic meniscus injury, patellofemoral osteoarthritis, surgical treatment (meniscectomy and repair), brace treatment (early stage of meniscus injury), and immobilization).

- Concept

This is a scoping review of the effectiveness of rehabilitation for patients with osteoarthritis of the knee with isolated meniscus injury. Comparisons will be made between usual care, placebo, and oral medication.

- Context

No limitation on location, race, or gender has been imposed. The search results are limited to original papers published in peer-reviewed journals, with no language restrictions, and include studies of any follow-up period.

- Types of Sources

The research designs to be covered include interventional studies, observational studies (including cohort, cross-sectional, and longitudinal studies), case reports, and searches in gray literature[11]. Gray literature will be searched appropriately, based on the JBI scoping review methodology. Systematic reviews, meta-analyses, and narrative reviews will be excluded.

Methods

This protocol was developed based on PRISMA-ScR [12]. As noted above, the scoping review will also be conducted based on the scoping review methodology by the JBI [13].

Search Strategy

The search strategy is aimed at finding published studies, and a comprehensive electronic search will be conducted of PubMed, CINAHL, and the Web of Science, using the Physiotherapy Evidence Database (PEDro). (Search date: From inception to September 2021)

A complete search strategy for the four databases has been developed using the words in the titles and abstracts of the relevant papers (the appendix contains more details).

Study/Source of Evidence Selection

PubMed, CINAHL, Web of Science, and PEDro databases will be searched and checked against all identified citations. The collated results will be uploaded to Rayyan [14] (Qatar Computing Research Institute, Ar Rayyan, Qatar) and duplicate references will be removed.

After a pilot test with two independent reviewers, the title and abstract will be evaluated against the inclusion criteria. All evaluated information will be maintained by Rayyan, and the full text of selected citations will be evaluated by two or more independent reviewers, according to the inclusion criteria.

Literature that does not meet the inclusion criteria will be reported in the scoping review with reasons for exclusion. Any disagreements that may arise between reviewers at any stage of the selection process will be discussed and resolved among the reviewers. If agreement still cannot be reached, this will be discussed with a third reviewer.

The results of the search and the process for the inclusion and exclusion criteria will be reported in the scoping review and shown in the PRISMA 2020 statement: an updated guideline for reporting systematic reviews flowchart [15].

Data Extraction

The extracted dissertations will be run using a data extraction tool. Data will specifically show findings related to participants, concepts, context, study design, and review questions.

The extracted form will contain information such as author name and year of publication, country where the study was conducted, purpose of the study, study population (age, gender) and sample size, type of meniscus injury (e.g., isolated medial/lateral meniscus injury), type and duration of intervention (including follow-up duration of the intervention), outcomes, study design and details, and key findings related to the scoping review questions.

Data extraction is the process of extracting data from each target evidence source, and any disagreements among reviewers are discussed and resolved among the reviewers. If there is still no agreement, explain in the scoping review that you have discussed with a third reviewer.

If necessary, the authors of the paper will be contacted to request missing or additional data.

Data Analysis and Presentation

The data will be presented in the form of graphs, diagrams and tables.

Acknowledgements

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None.

Conflicts of Interest

There are no conflicts of interest in this project.

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Appendix : Search strategy

- ✓ **PubMed search strategy**

  (menisci, tibial[mh] OR menisc*[tiab] OR meniscus[mh] OR meniscus[tiab] OR meniscal[tiab] OR "tibial meniscus injuries"[mh]) AND ("physical therapy modalities"[mh] OR "physical therapy"[tiab] OR physiotherapy[tiab] OR kinesiotherapy[tiab] OR rehabilitation[mh] OR rehabilitation[tiab] OR "resistance training"[mh] OR "resistance training"[tiab] OR "strength training"[tiab] OR "neuromuscular training"[tiab] OR "exercise therapy"[mh] OR "exercise therap*"[tiab] OR "exercise program*"[tiab] OR "exercise training"[tiab] OR "aerobic training"[tiab] OR "aerobic exercis*"[tiab] OR "training program*"[tiab] OR "resistive exercis*"[tiab] OR "resistive training"[tiab] OR "endurance training"[mh] OR "endurance training"[tiab] OR "endurance exercis*"[tiab] OR Instructio*[tiab])

- ✓ **CINAHL search strategy**

  (MH menisci, tibial OR TI menisc* OR AB menisc* OR MH meniscus OR TI meniscus OR AB meniscus OR TI meniscal OR AB meniscal OR MH "tibial meniscus injuries") AND (MH "physical therapy modalities" OR TI "physical therapy" OR AB "physical therapy" OR TI physiotherapy OR AB physiotherapy OR TI kinesiotherapy OR AB kinesiotherapy OR MH rehabilitation OR TI rehabilitation OR AB rehabilitation OR MH "resistance training" OR TI "resistance training" OR AB "resistance training" OR TI "strength training" OR AB "strength training" OR TI "neuromuscular training" OR AB "neuromuscular training" OR MH "exercise therapy" OR TI "exercise therap*" OR AB "exercise therap*" OR TI "exercise program*" OR AB "exercise program*" OR TI "exercise training" OR AB "exercise training" OR TI "aerobic training" OR AB "aerobic training" OR TI "aerobic exercis*" OR AB "aerobic exercis*" OR TI "training program*" OR AB "training program*" OR TI "resistive exercis*" OR AB "resistive exercis*" OR TI "resistive training" OR AB "resistive training" OR MH "endurance training" OR TI "endurance training" OR AB "endurance training" OR TI "endurance exercis*" OR AB "endurance exercis*" OR TI Instructio* OR AB Instructio*)

- ✓ **Web of science search strategy**

  (meniscus OR “tibial meniscus injuries”) AND (“physical therapy modalities” OR “physical therapy” OR physiotherapy OR kinesiotherapy OR rehabilitation OR “resistance training” OR “strength training” OR “neuromuscular training” OR "exercise therapy" OR "exercise program*" OR "exercise training" OR "aerobic training" OR "training program*" OR "resistive exercis*" OR "resistive training" OR "endurance training" OR "endurance exercis*" OR Instructio*)

- ✓ **Physiotherapy Evidence Database (PEDro) search strategy**

  Abstract & Title: menisc*

  Therapy: Fitness training OR Strength training

  Body Part: Lower leg or knee

✓ **Open Gray**

Meniscus