

The Effectiveness of Mulligan Mobilization With Movement (MWM) in Lateral Epicondylitis Conditions: a Critical Review

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ABSTRACT

Background: Lateral epicondylitis is a common injury in tennis and badminton players. This lateral epicondylitis condition generally appears in any individual or an activity that requires a circular motion of the forearm. These movements when performed repeatedly accompanied by loading when gripping or wrist extension can increase the risk of lateral epicondylitis. Complaints that arise in the condition of lateral epicondylitis include experiencing pain in the lateral elbow and weakness of the wrist or wrist. Mulligan mobilization with movement is a modern technique developed by Mulligan to treat musculoskeletal complaints such as lateral epicondylitis.

Objective: This study aims to determine the effectiveness of giving mulligan mobilization with movement in lateral epicondylitis conditions.

Method: The research method used is critical review. This method is used to analyze, summarize or evaluate an action. The critical review is done by evaluating the selected articles using the PEDro Scale.

Results: The results of the review of the five articles that have been screened including the inclusion criteria found that various modalities were used, either singly or in combination. This Mulligan mobilization with movement can reduce pain and improve functional ability in the elbow.

Conclusion: Mulligan mobilization with movement is effective and can be used as an alternative choice in the treatment of lateral epicondylitis. Mobilization with movement techniques can be combined with several therapeutic measures such as conventional treatments and exercise to get optimal results.

Keywords: *Mulligan Technique, mobilization with movement, MWM, lateral epicondylitis, tennis elbow*

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INTRODUCTION

In sports activities, there are many activities carried out by several sports that involve the upper limbs in the form of the tennis court or badminton, however sports activities carried out by people experience an injury. Injuries in general that occur in tennis and badminton players are in the form of injuries to the elbow which are commonly called tennis elbow or lateral epicondylitis.

Lateral epicondylitis is also known as tennis elbow is an injury that occurs due to overuse or excessive activity (Farrell, 2017; Welsh, 2018). This lateral epicondylitis condition generally appears in any individual or activity that requires a circular motion of the forearm. The risk is increased with repetitive movement

accompanied by increased grip or wrist extension (for example in badminton and tennis players) (Apriliani, 2017; Fischer, 2020). Regular tennis players have the potential to develop lateral epicondylitis during their playing career (Shiri & Juntura, 2011). It is also believed that the backhand swing is the main aspect (Brummel *et al.*, 2014). Most of them experience pain and weakness in the *wrist*, which causes complaints to sufferers in carrying out daily activities (Wolf, 2015; Bagade & Verma, 2015). It is recommended to speed up the healing process so as not to further interfere with activities and cause further problems (Coombes *et al.*, 2015).

The incidence of *lateral epicondylitis* in the general population is 1%-3% and the incidence

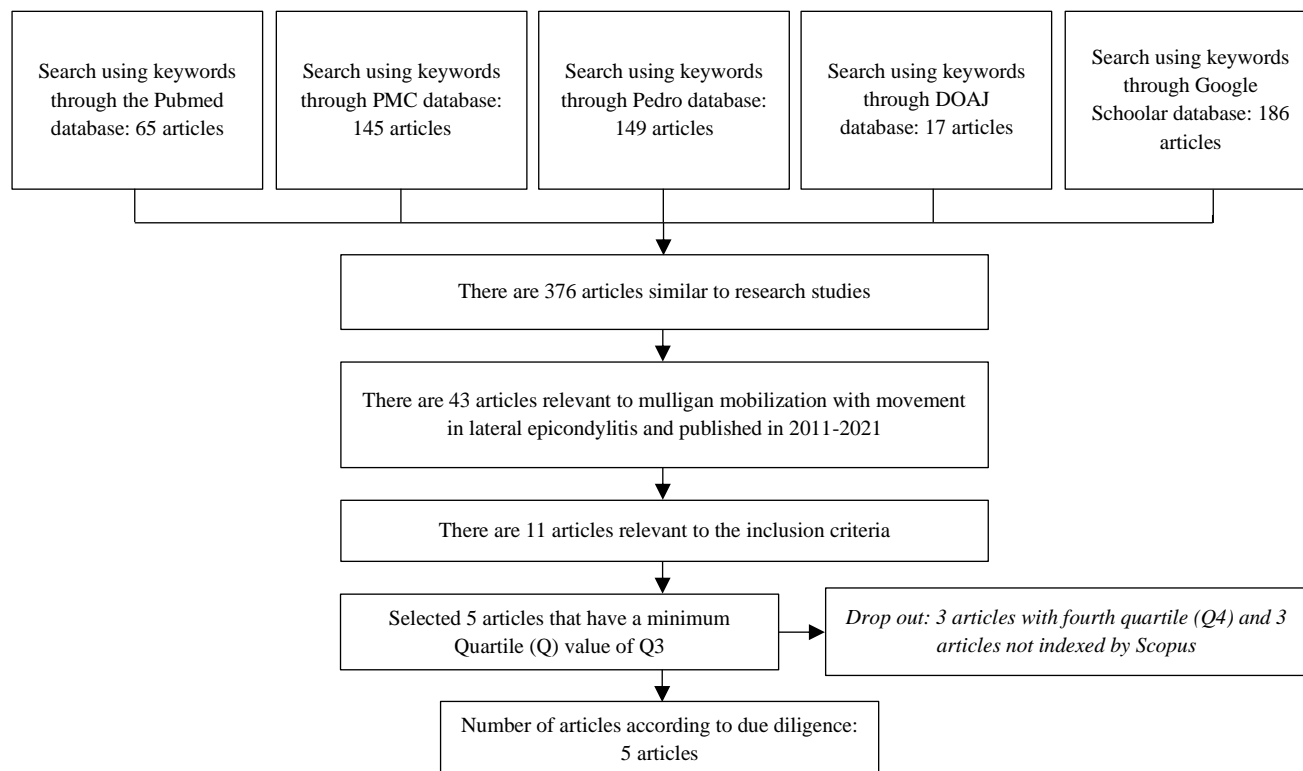
is higher in those aged over 35-55 years and in women aged 42-46 years old (Arirachakaran *et al.*, 2016). According to Rudianto & Sinuhaji (2018) individuals with complaints of *lateral epicondylitis* occur under the age of 25 years old and the elderly or over 60 years are rare. It is estimated that 65% of all patients with *lateral epicondylitis* are experienced by novice tennis players, while 35% are experienced by various professions other than novice tennis players such as painters or sculptors.

According to Baker *et al.* (2013) *mobilization with movement* is a modern technique developed by Mulligan to treat the symptoms of *tennis elbow* or *lateral epicondylitis*. *Mulligan mobilization with movement* (MWM) is a form of *manual therapy* that includes *sustained lateral glide movements* to the *elbow joint* along with physiological movements (Hing *et al.*, 2015; Mani *et al.*, 2017; Bessler & Beyerlein, 2019). MWM has been shown to reduce pain and increase functional activity (Janikowska & Fidut, 2013; Ahuja, 2014).

METHODS

This research uses the critical review study design method on randomized control trial (RCT) article. A randomized controlled trial (RCT) is an experimental form of evaluation in which the population that receives the program or intervention is selected at random from the population or sample that has met the requirements (Pristianto *et al.*, 2021). Search articles/journals through search engine and the database used are Google scholar, Physiotherapy Evidence Database (Pedro), Pubmed, and Directory of Open Access Journals (DOAJ). The criteria for articles are Q1-Q3 quartiles and published from 2011-2021 or the last 10 years.

There were 562 articles that were then filtered and 43 articles were found that matched the title. Then it was filtered again and then adjusted to the criteria and entered in SCImago Journal and Country Rank (SJR) and got five articles that had quartiles Q1-Q3. The critical review is done by evaluating the selected articles using the PEDro scale.



Picture 1. Article Search and Filtering Flow

RESULTS

After checking the full paper on the selected article, the PICO standard check is carried out. The goal is to determine whether the articles used are worthy of being used as

references in the research being conducted. The table below shows the PICO appraisals of the five selected articles.

Table 1. Articles Obtained

Writer (Year)	Quartile (Q)	PEDro Scale	Population
Patel (2013)	Q2	5/10	The subjects of this study were taken from the Civil Hospital of the outpatient department of orthopedics in Ahmedabad, India. A total of 30 patients had unilateral lateral epicondylitis for approximately 3 months.
Hariharasudhan & Balamurugan (2015)	Q2	6/10	The subjects of this study were taken and simultaneously carried out at the Global Hospital and City of Health, Chennai 100, Tamil Nadu, India. A total of 43 patients and 4 of them had bilateral epicondylitis.
Rahman <i>et al.</i> (2016)	Q2	7/10	The subjects of this study were taken from GSL General Hospital and located around Rajahmundry India. A total of 60 subjects were divided into 2 groups A and B with 30 in each group.
Martínez <i>et al.</i> (2017)	Q2	6/10	The subjects of this study were taken from the Inpatient Public Health Center in the Madrid Spanish community as many as 24 people out of a total of 26 patients (2 people refused).
Reyhan <i>et al.</i> (2020)	Q2	7/10	The subjects of this study were drawn from an outpatient clinic affiliated with the department of physical medicine, rehabilitation, orthopedics and traumatology at Istanbul University Medical Faculty, Turkey. A total of 40 patients are willing to be the subject and meet the criteria.

Table 2. PICO

Title	Population	Intervention	Comparison	Outcome
Effectiveness of Mobilization with movement of Elbow Compared with Manipulation of Wrist in Patients of Lateral Epicondylitis (Patel, 2013) https://www.ijmhr.org/ijpr_articles_vol1_4/346.pdf	The subjects of this study were taken from the Civil Hospital of the outpatient department of orthopedics in Ahmedabad, India A total of 30 patients with unilateral lateral epicondylitis for approximately 3 months	Mobilization with movement, Conventional treatment (Ultrasound, Static stretching, Strengthening exercise)	Wrist manipulation, Conventional treatment (Ultrasound, Static stretching, Strengthening exercise)	Baseline measurements of pain (VAS score), functional status (PRTEE questionnaire), and strength (maximum isometric grip strength) were taken on days 1 and 10 after the treatment session.
Effectiveness of muscle energy technique and Mulligan's movement with mobilization in the management of lateral epicondylgia (Hariharasudhan & Balamurugan, 2015) https://doaj.org/article/23704dc5d441407ea2da36e87c8fc0fd	The subjects of this study were taken from and carried out at the Global Hospital and City of Health, Chennai 100, Tamil Nadu, India. A total of 43 patients and 4 of them were bilateral epicondylitis, 7 had been given steroid injections and 2 patients did not want to participate	Mobilization with movement, Conventional treatment (Ultrasound Therapeutic)	Muscle Energy Technique, Conventional treatment (Ultrasound Therapeutic)	The measurement results are measured in the form of a visual analog scale (VAS) and elbow functional assessment (EFA) questionnaire at the beginning of day 10 and were given follow-up after 3 weeks.
Effectiveness of Mulligan Mobilisation with Movement Compared to Supervised Exercise Program in Subjects with Lateral Epicondylitis (Rahman <i>et al.</i> , 2016) http://www.ijmhr.org/ijpr.4.2/IJPR.2016.104.html	All subjects of this study were taken from GSL General Hospital and the area around Rajahmundry India. A total of 60 subjects were divided into 2 groups A and B	Mobilization with movement	Supervised exercise program treatment	Pain intensity was measured by a visual analog scale (VAS). Hand grip strength was measured using a hand grip dynamometer (HGD).
Influence of Expectations Plus Mobilization with movement in Patient with Lateral Epicondylgia: a Pilot Randomized Controlled Trial (Martínez <i>et al.</i> , 2017) https://doaj.org/article/23704dc5d441407ea2da36e87c8fc0fd	A total of 26 subjects, but 2 of them refused and the results received as many as 24 people. All of these subjects were taken from the Inpatient Community Health Center in Madrid, Spain.	Mobilization with movement, Influence of expectations (positive)	Mobilization with movement, Influence of expectations (neutral)	The measurement results are measured in the form of a visual analog scale (VAS) functional status (PRTEE questionnaire)
The Effects of Mulligan's Mobilization with Movement Technique in Patients with Lateral Epicondylitis (Reyhan <i>et al.</i> , 2020) https://pubmed.ncbi.nlm.nih.gov/31104005/	A total of 40 patients who are willing to be the subject and meet the criteria. All of these subjects were taken from an affiliated outpatient clinic at Istanbul University Turkey.	Mobilization with movement, Exercise and Cold Therapy	Exercise and Cold Therapy	Measurement of baseline pain (VAS), functional status (PRTEE questionnaire), pain free grip strength (painless and maximum) to measure grip strength.

Of the five selected articles, three of them are from India and the remaining two are from Turkey and Spain. There are various kinds of interventions that are carried out either in combination or single treatment. The comparison in this study is the conventional treatment given to treat lateral epicondylitis conditions. The outcomes in this study were measuring pain intensity with the Visual Analog Scale (VAS), measuring functional ability at the elbow with a Patient-Rated Tennis Elbow Evaluation (PRTEE) questionnaire, functional assessment at the elbow with the Elbow Functional Assessment (EFA), measuring hand grip strength with Hand Grip Dynamometer (HGD).

Go to the next stage, which is to do a checking technique using the PEDro scale. The aim is to see the quality of the articles with a Randomized Control Trial (RCT) study design. The results of the PEDro scale can make it easier for researchers to quickly assess

whether the articles used have a high, medium or low level of risk of bias, which of course can affect the results of the research to be carried out. There are a total of 11 items in the PEDro scale, namely: 1). Eligibility criteria (eligibility criteria); 2). random allocation (random allocation); 3). hidden allocation (concealed allocation); 4). Similarity to the baseline (baseline comparability); 5). Blind subjects (blind assessors); 8). At least one main outcome >85% follow-up (adequate follow-up); 9). Analysis for action (intention-to-treat analysis); 10). statistical comparison between groups (between-group comparison); and 11). Point estimates and variability. Each is worth 1 point. points. If the item is listed in the article then it is given a value of 1 and if it is not listed it is given a value of 0. For the eligibility criteria (eligibility criteria) it is calculated on the total score so that the total overall score is 10 from the overall results.

Table 3. PEDro Scale

Title	Quartile (Q)	Eligibility Criteria	Random Allocation	Concealed Allocation	Baseline Comparability	Blind Subjects	Blind Therapists	Blind Assessors	Adequate Follow up	Intention-to-treat Analysis	Between Group Comparison	Point Estimates and Variability	Result
Effectiveness Of Mobilization with movement Of Elbow Compared With Manipulation Of Wrist In Patients Of Lateral Epicondylitis (Patel, 2013) https://www.ijmhr.org/ijpr_articles_vol1_4/346.pdf	Q2	√	√	X	√	X	X	X	X	√	√	√	5/10
Effectiveness of muscle energy technique and Mulligan's movement with mobilization in the management of lateral epicondylalgia (Hariharasudhan & Balamurugan, 2015) https://doaj.org/article/23704dc5d441407ea2da36e87c8fc0fd	Q2	√	√	√	√	X	X	X	√	X	√	√	6/10
Effectiveness of Mulligan Mobilisation with Movement Compared to Supervised Exercise Program in Subjects with Lateral Epicondylitis (Rahman <i>et al.</i> , 2016) http://www.ijmhr.org/ijpr.4.2/IJPR.2016.104.html	Q2	√	√	√	√	X	X	X	X	√	√	√	7/10
Influence of Expectations Plus Mobilization with movement in Patient with Lateral Epicondylalgia: a Pilot Randomized Controlled Trial (Martínez <i>et al.</i> , 2017) https://doaj.org/article/23704dc5d441407ea2da36e87c8fc0fd	Q2	√	√	X	√	X	X	X	√	√	√	√	6/10
The Effects of Mulligan's Mobilization with Movement Technique in Patients with Lateral Epicondylitis (Reyhan <i>et al.</i> , 2020) https://pubmed.ncbi.nlm.nih.gov/31104005/	Q2	√	√	√	√	X	X	X	√	√	√	√	7/10

DISCUSSION

To see the effectiveness of giving mobilization with movement (MWM) in this lateral epicondylitis condition, it can be seen in many ways. The review is based on the condition of physiotherapy services in the patient's area, the patient's age factor, the patient's understanding of receiving education from physiotherapy and the symptoms suffered by the patient.

Look at the population of the five articles reviewed in the three journals from India and the rest both from Turkey and Spain. Two articles originating from Turkey and Spain are part of developed countries and three articles originating from India are developing countries. Of the five reviewed articles, one article used mulligan mobilization with movement as a single intervention while the other four articles used mulligan mobilization with movement in combination with other interventions such as: conventional treatments (Ultrasound, Static stretching, Steering exercise), Effects of expectations (positive), Exercise and Cold Therapy. Overall, it is stated that the handling of mulligan mobilization with movement as a single intervention or in combination can reduce a complaint in the form of pain and increase functional activity in patients with lateral epicondylitis. Compared with research Rahman et al. (2016) suggest that mulligan mobilization with this movement can reduce pain and improve functional ability. Of the five journals reviewed, on average they have a moderate level of bias where this can be seen through the PEDro scale, which can occur in the blind subject section, therapists and assessors where the results are not available or not, in these five articles the moderate bias does not have an impact on the research results. journal, where the results of this journal research show the success of a treatment.

The age of the patient in the study as a whole ranged from 18-65 years, in this case many causes of a case of lateral epicondylitis

that arise from several factors including work factors and activities that perform repetitive movements. In addition, it is also comparable to research Martínez *et al.* (2017) which states that the prevalence of lateral epicondylitis is on average due to repetitive tasks or repetitive work, but according to Patel (2013) and Rahman *et al.* (2016), the most obvious factor is the injury to the tendon tissue around the elbow.

The intervention given in the entire article that is used as the theoretical basis is mulligan mobilization with movement and overall states that this intervention can be accepted and used as an alternative choice in relieving pain and improving functional ability in patients with symptoms of lateral epicondylitis. In this study, there are still some limitations, for the author it is quite difficult to find quality research articles with a value of quartile one even though there are some that approach the appropriate inclusion criteria but are not listed on the SJR. Not only that, in Indonesia itself it is very rare to find studies related to MWM and with a high quartile index. This makes researchers not know for sure the level of effectiveness of the handling of mulligan mobilization with movement (MWM) in Indonesia.

CONCLUSION

Based on the results of a critical review study of five selected articles, the provision of mulligan mobilization with movement was effectively used. This technique can be used as an alternative choice in handling a case, especially in lateral epicondylitis conditions. In addition, not only the provision of MWM, but the combination with several therapeutic measures such as conventional treatments and exercise can show optimal results. Physiotherapists can use MWM single treatment or a combination in treating cases of lateral epicondylitis. Of course, provided that the application is correct, both in technique and in the time/dose of giving MWM.

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