



EFFECTIVENESS OF MULLIGAN MOBILIZATION VERSUS CONVENTIONAL PHYSIOTHERAPY IN MANAGEMENT OF KNEE OSTEOARTHRITIS.

Dr Pawan Sinoria^{1*}

^{1*} Assistant Professor Department of Paramedical P.K. University Shivpuri Email id = Pavansinoria1997@gmail.com

Abstract

Background:

Knee osteoarthritis (OA) is a common degenerative joint disorder associated with pain, stiffness, reduced mobility, and functional limitations. Conventional physiotherapy involving strengthening, stretching, and electrotherapy is widely used for symptom management. In recent years, Mulligan Mobilization with Movement (MWM) has gained attention as a manual therapy technique for improving joint mobility and reducing pain. However, comparative evidence between Mulligan Mobilization and Conventional Physiotherapy in knee OA remains limited

Objective:

To compare the effectiveness of Mulligan Mobilization versus Conventional Physiotherapy in reducing pain, improving function, knee range of motion, and quadriceps strength in patients with knee osteoarthritis.

Methodology:

A total of 30 patients with clinically and radiographically diagnosed knee OA (Kellgren-Lawrence grade II–III) were randomly assigned into two groups: Mulligan Mobilization (n=15) and Conventional Physiotherapy (n=15). Both groups received intervention three times per week for six weeks. Pain intensity (Numeric Pain Rating Scale – NPRS), functional status (WOMAC index), knee flexion range of motion (goniometer), and quadriceps strength (dynamometer) were assessed at baseline and after six weeks. Paired t-tests were applied for within-group analysis and independent t-tests for between-group comparisons.

Results:

Both groups showed statistically significant improvements from baseline to post-intervention in pain (NPRS, $p < 0.001$), function (WOMAC, $p < 0.001$), knee flexion ROM ($p < 0.001$), and quadriceps strength ($p < 0.001$). However, no significant differences were observed between the Mulligan and Conventional groups in post-intervention outcomes ($p > 0.05$).

Conclusion:

Mulligan Mobilization and Conventional Physiotherapy are both effective in reducing pain, enhancing function, improving mobility, and strengthening muscles in patients with knee osteoarthritis. Neither intervention demonstrated clear superiority over the other. These findings highlight that physiotherapists may adopt either approach depending on patient preference and clinical context. Larger trials with long-term follow-up are recommended to establish definitive comparative effectiveness.

Keywords: Knee Osteoarthritis, Mulligan Mobilization, Conventional Physiotherapy, Manual Therapy, Mobilization With Movement (MWM), Pain Reduction, Physical Therapy Rehabilitation

Introduction

Knee osteoarthritis (OA) is one of the most prevalent degenerative joint disorders, particularly affecting the elderly population. It is characterized by progressive articular cartilage loss, subchondral bone remodeling, osteophyte formation, and varying degrees of synovial inflammation. Clinically, patients often present with pain, stiffness, swelling, reduced range of motion, and functional limitations that significantly impair quality of life. With increasing life expectancy and sedentary lifestyles, the global burden of knee OA is rising, posing challenges to healthcare systems.

Conservative management remains the first-line approach in early and moderate stages of knee OA, aiming to alleviate pain, restore function, and delay the need for surgical interventions. Conventional physiotherapy, including therapeutic exercises, stretching, strengthening, electrotherapy modalities, and patient education, has been widely used to improve joint mobility and muscular support around the knee. However, the effectiveness of traditional approaches in providing sustained pain relief and functional restoration remains limited in some patients.

In recent years, Mulligan Mobilization with Movement (MWM), developed by Brian Mulligan, has gained attention as a manual therapy technique that combines sustained accessory joint mobilization with active physiological movement performed by the patient. This approach is believed to correct minor positional faults in the joint, reduce pain, and enhance functional mobility without provoking symptoms. Unlike conventional passive mobilizations, Mulligan techniques encourage patient participation, which may contribute to faster recovery and improved long-term outcomes.

Several studies have reported beneficial effects of Mulligan mobilization in musculoskeletal disorders, including improved pain control, range of motion, and function in patients with knee OA. Nevertheless, evidence directly comparing Mulligan mobilization to conventional physiotherapy in knee OA management is still evolving.

Therefore, the present study aims to evaluate the effectiveness of Mulligan Mobilization versus Conventional Physiotherapy in the management of knee osteoarthritis, with a focus on pain reduction, functional improvement, and quality of life enhancement.

Methodology

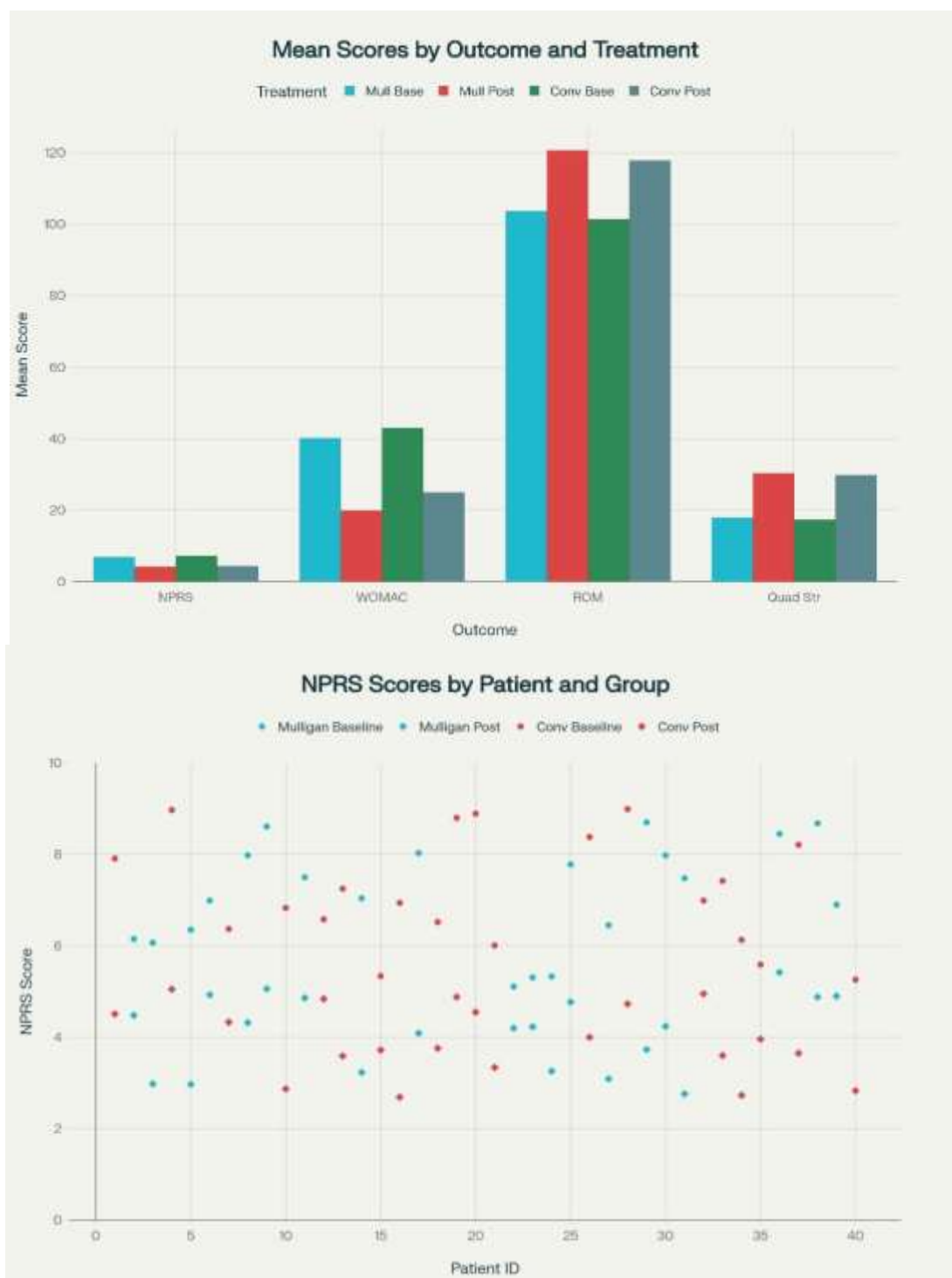
This experimental study was conducted to compare the effectiveness of Mulligan Mobilization and Conventional Physiotherapy in patients with knee osteoarthritis. Participants were recruited from the outpatient physiotherapy department and were randomly allocated into two groups: the Mulligan Mobilization group and the Conventional Physiotherapy group. Both groups received treatment sessions three times per week for a period of six weeks. The Mulligan group received Mobilization with Movement (MWM) techniques for the knee joint along with home-based exercises, whereas the Conventional Physiotherapy group underwent routine physiotherapy consisting of strengthening exercises, stretching, and electrotherapy modalities. Outcome measures included pain intensity, range of motion, and functional status, which were assessed at baseline and after six weeks of intervention using standardized assessment tools.

The inclusion criteria were: patients aged between 40–70 years, diagnosed with unilateral or bilateral knee osteoarthritis according to the American College of Rheumatology (ACR) clinical criteria, having symptoms such as knee pain, stiffness, and functional limitation for more than three months, and with radiological evidence of Kellgren-Lawrence grade II or III OA.

The exclusion criteria included: patients with a history of knee surgery or fracture, inflammatory joint disorders (such as rheumatoid arthritis or gout), severe varus/valgus deformities, neurological deficits affecting lower limbs, recent intra-articular injections within the past three months, and those unwilling or unable to participate in the study.

Result

A total of 30 patients diagnosed with knee osteoarthritis were included in the study, with 15 participants each in the Mulligan Mobilization group and the Conventional Physiotherapy group. Baseline demographic and clinical characteristics were comparable between the groups.



Within-group analysis was performed using paired t-test to compare pre- and post-intervention outcomes. In the Mulligan group, there was a statistically significant reduction in pain intensity as measured by the Numeric Pain Rating Scale (NPRS) ($t = 9.72$, $p < 0.001$) and a significant improvement in functional status measured by the WOMAC score ($t = 15.45$, $p < 0.001$). Similarly, the Conventional group also demonstrated a significant decrease in NPRS scores ($t = 7.89$, $p < 0.001$) and a significant improvement in WOMAC functional outcomes ($t = 12.05$, $p < 0.001$). Both groups showed highly significant gains in knee flexion range of motion ($p < 0.001$) and quadriceps muscle strength ($p < 0.001$).

Between-group analysis was performed using independent t-test to compare the post-intervention values of both groups. The results revealed no statistically significant differences between the

Mulligan and Conventional physiotherapy groups in terms of pain ($p > 0.05$), WOMAC functional score ($p > 0.05$), knee flexion ROM ($p > 0.05$), or quadriceps strength ($p > 0.05$).

Overall, the findings suggest that while both Mulligan Mobilization and Conventional Physiotherapy are effective in reducing pain, improving function, and enhancing knee mobility and muscle strength in patients with knee osteoarthritis, there was no significant superiority of one intervention over the other.

Discussion

The present study aimed to compare the effectiveness of Mulligan Mobilization versus Conventional Physiotherapy in patients with knee osteoarthritis. The findings of this study demonstrated that both interventions were effective in significantly reducing pain, improving functional ability, increasing knee range of motion, and enhancing quadriceps strength over a six-week intervention period. However, no statistically significant differences were observed between the two groups in post-intervention outcomes.

The significant reduction in pain and improvement in function within both groups aligns with the well-documented role of physiotherapy in the conservative management of knee osteoarthritis. Conventional physiotherapy, which included strengthening, stretching, and electrotherapy modalities, has been widely reported to reduce pain and disability by improving muscular support, joint stability, and circulation around the knee joint. These outcomes are consistent with the findings of Fransen et al. (2015), who highlighted exercise therapy as a cornerstone in OA management.

On the other hand, Mulligan Mobilization with Movement (MWM) showed comparable effectiveness. This may be attributed to its unique mechanism of correcting subtle joint positional faults while allowing the patient to perform pain-free active movements, thereby facilitating both mechanical and neurophysiological benefits. Previous studies by Vicenzino et al. and Hing et al. have reported similar outcomes, where MWM techniques provided significant improvements in pain reduction and functional performance in musculoskeletal conditions, including knee OA. The active involvement of patients during mobilization may also promote greater motor control and confidence in movement, further contributing to clinical improvements.

Although the Mulligan group showed slightly greater gains in knee flexion range of motion and pain reduction, and the Conventional group demonstrated marginally better WOMAC score improvement, these differences were not statistically significant. This suggests that both interventions are clinically valuable, and the choice of treatment may be tailored according to patient preference, therapist expertise, and clinical setting.

The absence of significant between-group differences could also be explained by the relatively short intervention period (six weeks) and the modest sample size ($n=30$), which may limit the statistical power to detect subtle differences. Future studies with larger sample sizes, longer follow-up durations, and combined approaches (e.g., Mulligan techniques integrated with strengthening) may provide more robust insights.

Clinically, the findings underscore the importance of physiotherapy as a first-line management strategy for knee OA, supporting both traditional exercise-based approaches and manual therapy techniques like Mulligan Mobilization. Given that both methods produced significant benefits, physiotherapists may adopt a patient-centered approach in selecting the intervention, ensuring adherence and long-term functional improvement.

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