Original Research Paper

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EFFECTIVENESS OF KINESIOTAPING AND BRACING ALONG WITH EXERCISE THERAPY ON PAIN, RANGE OF MOTION, AND FUNCTION IN GRADE-II KNEE OSTEOARTHRITIC PATIENTS: A COMPARATIVE STUDY

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ABSTRACT Knee osteoarthritis is a common degenerative joint disorder characterized by pain, restricted joint mobility, and functional limitations that significantly affect quality of life. Conservative management approaches such as kinesiotaping and knee bracing are widely used; however, comparative evidence regarding their effectiveness remains limited. This randomized comparative study aimed to evaluate the effectiveness of kinesiotaping and knee bracing in reducing pain, improving knee range of motion, and enhancing functional ability in individuals with grade-II knee osteoarthritis. A total of 70 participants with radiologically confirmed grade-II knee osteoarthritis and a minimum Numeric Pain Rating Scale score of 4 were randomly allocated into two groups: a kinesiotaping group (n = 35) and a knee bracing group (n = 35). Both interventions were administered over a period of four weeks. Outcome measures included pain intensity assessed using the Numeric Pain Rating Scale, functional status evaluated with the Western Ontario and McMaster Universities Osteoarthritis Index, and knee range of motion measured using a goniometer. Assessments were conducted at baseline, at two weeks, and at the end of four weeks. Results demonstrated that both intervention groups showed notable improvements in pain, functional performance, and knee range of motion following the treatment period. Participants in the kinesiotaping group exhibited a greater reduction in pain intensity compared to those in the knee bracing group. These findings suggest that while both kinesiotaping and knee bracing are effective conservative interventions for managing grade-II knee osteoarthritis, kinesiotaping may offer superior pain-relieving benefits. Further research with longer follow-up periods is recommended to evaluate sustained effects and long-term comparative outcomes.

KEYWORDS : Knee osteoarthritis; Kinesiotaping; Knee bracing; Exercise therapy

INTRODUCTION

Modern understanding classifies OA as a whole-joint disorder with multiple contributing factors, including the degradation of hyaline cartilage, inflammation of the synovial membrane, subchondral bone sclerosis, ligament damage, and the formation of osteophytes.[1] Pain is often the earliest symptom, initially intermittent but gradually becoming persistent. Patients may also report coarse crepitus. As inflammation progresses in the synovial lining, it leads to swelling. Muscle spasms and pain contribute to joint stiffness, which is later compounded by capsular tightness and joint surface irregularities.This ultimately results in a decreased range of motion [2]

Exercise therapy, including range-of-motion and strengthening exercises.[3] is considered a primary, conservative treatment approach for OA management. [4]

Kinesiotaping, a widely adopted physiotherapy intervention, has shown significant benefits in the management of OA. First developed in Japan in 1979,Kinesio tape is a stretchable cotton material with a heat-sensitive acrylic adhesive. It aims to enhance muscular flexibility and strength while supporting joints without limiting functional movement.

Kinesiotaping promotes the body's natural healing mechanisms and provides structural support to the musculoskeletal system.[5-6]

Braces are non-invasive, flexible orthopedic devices frequently recommended for conservative OA treatment. They are favored for their ease of application, minimal side effects, and affordability. Bracing helps alleviate OA symptoms by reducing biomechanical stress on the knee joint, thereby decreasing pain and improving mobility. This intervention provides an effective Alternative for individuals seeking to avoid surgical procedures. [7]

METHODOLOGY

Study Design

This randomized controlled trial evaluated the effectiveness of knee bracing and kinesiotaping as adjuncts to exercise therapy in participants with grade-II knee osteoarthritis. Outcomes assessed included pain intensity, knee range of motion, and functional ability.

Participants

Seventy participants meeting inclusion criteria were randomly allocated into two groups (35 each) using a random number method.
Group A: Exercise therapy + knee bracing
Group B: Exercise therapy + kinesiotaping
All participants provided informed consent.

Intervention Protocol
Exercise Therapy (60 minutes per session)
Warm-up (10 min): Active terminal knee movements and heel slide exercises to improve mobility.

Strengthening (40 min): Quadriceps exercises, straight leg raises, hamstring isometrics, hip strengthening.

Cool-down (10 min): Slow knee movements, relaxation, and deep breathing.

Group-Specific Interventions
Group A – Knee Bracing: Soft knee braces worn during daily activities to provide mechanical support and reduce pain (Davies et al., 1980).

Group B – Kinesiotaping: Elastic adhesive tape applied around the knee to reduce pain, enhance patellar alignment, and support muscle activation (Kase et al., 2003; Lee et al., 2018).

Treatment Duration: 4 weeks
Activity Modifications: Minimize stair climbing, avoid prolonged low sitting, avoid cross-leg sitting, maintain posture, use elevated seating, avoid high-impact activities.

Outcome Measures
Pain: Numeric Pain Rating Scale (NPRS)
Function: Western Ontario and McMaster Universities Osteoarthritis Index (WOMAC)

Knee ROM: Goniometer

Statistical Analysis
Data were analyzed using descriptive statistics (mean ± SD) with SPSS. Trends in pain, function, and ROM were compared between groups.

RESULTS

A total of 70 participants with grade-II knee osteoarthritis completed the study and were included in the statistical analysis.

Gender Distribution

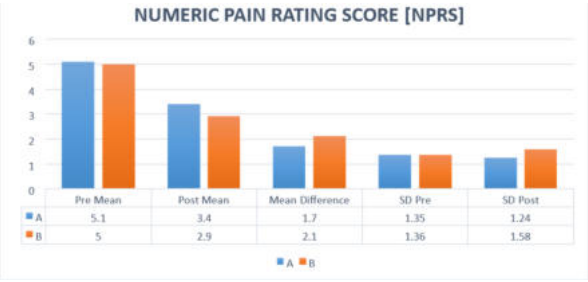
The study sample consisted of 29 males (41.43%) and 41 females (58.57%). Gender distribution was comparable between both

intervention groups, indicating balanced allocation and minimizing gender-related bias.

Numeric Pain Rating Scale (NPRS)

Pain intensity showed a reduction in both groups following the intervention. In Group A (kinesiotaping), the mean NPRS score decreased from 5.1 at baseline to 3.4 post-intervention, with a mean difference of 1.7. In Group B (bracing), the mean NPRS score reduced from 5.0 to 2.9, with a mean difference of 2.1. Both interventions were effective in reducing pain; however, greater pain reduction was observed in the kinesiotaping group (Table 1).

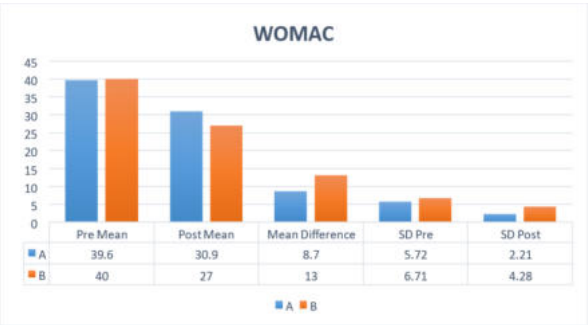
Table 1.Numeric Pain Rating Scale



Western Ontario and McMaster Universities Osteoarthritis Index (WOMAC)

Functional ability, assessed using the WOMAC index, improved in both groups after four weeks of intervention. Group A showed a reduction in mean WOMAC score from 39.6 pre-intervention to 30.9 post-intervention, with a mean difference of 8.7. Group B demonstrated a reduction from 40.0 to 27.0, with a mean difference of 13. These findings indicate improvement in pain, stiffness, and physical function in both groups, with relatively greater functional improvement noted in the kinesiotaping group (Table 2).

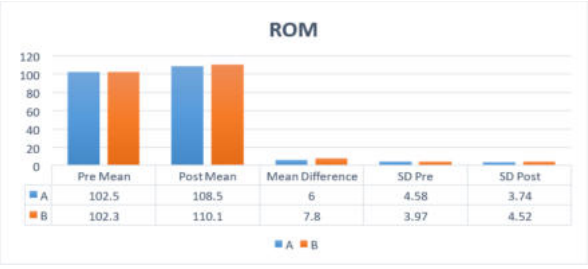
Table 2. Western Ontario And Mcmaster Universities Osteoarthritis Index (WOMAC)



Range Of Motion (ROM)

Knee joint range of motion increased in both intervention groups. In Group A, mean ROM improved from 102.5° at baseline to 108.5° post-intervention, showing a mean increase of 6°. In Group B, mean ROM increased from 102.3° to 110.1°, with a mean difference of 7.8°. These results suggest that both kinesiotaping and bracing were effective in improving knee joint mobility (Table 3).

Table 3. Range Of Motion



DISCUSSION

The findings of this comparative study highlight the efficacy of both kinesiotaping and bracing, when combined with exercise therapy, in alleviating pain, enhancing range of motion, and improving functional ability in patients with grade-II knee osteoarthritis. Notably, the kinesiotaping group demonstrated superior outcomes in pain reduction and functional improvement compared to the bracing group.The observed benefits of kinesiotaping may be attributed to its multifaceted mechanisms of action, including proprioceptive facilitation, anti-inflammatory effects, and enhanced lymphatic drainage. These factors collectively contribute to improved joint function and symptom alleviation.[8] While bracing provides structural support and stability to the knee joint, the results suggest that kinesiotaping may offer a more comprehensive approach to managing knee osteoarthritis symptoms. The dynamic nature of kinesiotaping allows for a range of motion while providing support, which may be advantageous in promoting functional ability [9].The study suggests that kinesiotaping combined with exercise therapy may be a preferred treatment strategy for patients with grade-II knee osteoarthritis. However Kinesiotaping is showing better results in comparison of Knee Brace.

CONCLUSION

The results of the present study indicate that both kinesiotaping and knee bracing, when used alongside exercise therapy, may be effective in reducing pain and improving functional outcomes in individuals with grade-II knee osteoarthritis. However, kinesiotaping demonstrated a greater trend toward pain reduction compared to knee bracing over the intervention period. These findings suggest that kinesiotaping may serve as a useful adjunct to conservative rehabilitation programs for knee osteoarthritis. Further studies with larger sample sizes and longer follow-up periods are recommended to evaluate sustained effects and long-term clinical benefits.

Limitations

- Small sample size
- Short study duration
- Restricted to grade-II OA
- No blinding
- Subjective outcome measures

Future Recommendations

- Larger sample size
- Longer follow-up
- Include multiple OA grades
- Objective outcome measures
- Evaluate after intervention withdrawal

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