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Comparative Study of Kinseiotaping Versus Conventional Physiotherapy on Pain and Functional Performance in Athletes with Patello Femoral Syndrome

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ABSTRACT

Background:. Kinesiotaping may help reduce pain and enhance function when used with physiotherapy. Patellofemoral Syndrome (PFS) is a common condition in athletes, causing anterior knee pain and reduced functional performance

Aim: To compare the effects of Kinesiotaping and Conventional Physiotherapy on pain and functional performance in athletes with PFS.

Methodology: A two-arm randomized controlled study was conducted over 6 months among 100 athletes with PFS. Participants were divided into Kinesiotaping Group (n=50) and Conventional Physiotherapy Group (n=50). Pain and functional performance were assessed before and after treatment using the Numeric Pain Rating Scale (NPRS) and Lower Extremity Functional Scale (LEFS). Data were analyzed using appropriate statistical tests at a significance level of $p<0.05$.

Results: Both groups showed improvement in pain and functional performance. The Kinesiotaping Group demonstrated greater improvement in NPRS and LEFS scores compared with the Conventional Physiotherapy Group, with statistically significant between-group differences ($p<0.05$).

Conclusion: Kinesiotaping combined with conventional physiotherapy may provide additional benefits in reducing pain and improving functional performance in athletes with PFS.

Keywords: Patellofemoral Syndrome, Kinesiotaping, Physiotherapy, Pain, Functional Performance, NPRS, LEFS.

Introduction

Patellofemoral Pain Syndrome (PFPS), commonly referred to as patellofemoral pain, is one of the most frequently encountered musculoskeletal conditions affecting the knee joint. It is characterized primarily by pain around or behind the patella that is aggravated during activities that increase loading of the patellofemoral joint, such as squatting, stair climbing, running, jumping, or prolonged sitting. The condition is particularly common among physically active adolescents and young adults, although it may occur in individuals across different age groups. Because of its recurrent nature and tendency to interfere with physical activity, PFPS can have a considerable effect on functional performance and quality of life[1].

The patellofemoral joint is formed by the articulation between the patella and the trochlear groove of the femur. The patella plays an important biomechanical role by improving the mechanical advantage of the quadriceps muscle and contributing to efficient knee extension. During knee movement, the patella glides within the trochlear groove while being influenced by muscular forces, ligamentous structures, lower-limb alignment, and the surrounding soft tissues. Normal patellar tracking depends on appropriate coordination between the quadriceps, hip musculature, and other structures involved in lower-extremity movement[2].

PFPS is considered a multifactorial condition rather than a disorder caused by a single structural abnormality. Several factors may contribute to the development and persistence of symptoms, including altered lower-limb biomechanics, weakness or reduced endurance of the hip abductors and external rotators, quadriceps weakness, impaired neuromuscular control, excessive or inappropriate training loads, reduced flexibility, and changes in lower-extremity movement patterns. Activities involving repetitive knee flexion and extension can increase patellofemoral joint loading and may provoke symptoms, particularly when combined with inadequate recovery or altered movement mechanics[3].

Aim

To compare the effectiveness of **Kinesio Taping versus Conventional Physiotherapy** on pain and functional performance in athletes with **Patellofemoral Pain Syndrome (PFPS)**.

Objectives

1. To determine the effect of **Kinesio Taping** on pain in athletes with patellofemoral pain syndrome.
2. To assess the baseline level of **pain** in athletes with patellofemoral pain syndrome before the intervention.
3. To evaluate the baseline **functional performance** of athletes with patellofemoral pain syndrome before treatment.
4. To determine the effect of **Kinesio Taping** on functional performance in athletes with patellofemoral pain syndrome

Methodology

Study Design

A two-arm, parallel-group randomized controlled trial will be conducted to compare the effects of Kinesiotaping and Conventional Physiotherapy on pain and functional performance in athletes with Patellofemoral Pain Syndrome (PFPS).

Study Duration and Setting

The study will be conducted over **4 months** in the Department of Physiotherapy/Orthopaedic Physiotherapy OPD of a selected hospital or physiotherapy centre.

Study Population and Sample Size

The study will include **100 athletes aged 18–35 years** with clinically diagnosed PFPS. Participants will be randomly divided into:

- **Group A (n=50):** Kinesiotaping + Conventional Physiotherapy
- **Group B (n=50):** Conventional Physiotherapy alone

Sampling and Randomization

Eligible participants will be recruited using consecutive/purposive sampling and randomly allocated into two groups using a computer-generated sequence or sealed-envelope method.

Eligibility Criteria

Athletes aged 18–35 years with activity-related anterior/peripatellar knee pain and a clinical diagnosis of PFPS will be included. Participants with major knee surgery, acute trauma, patellar instability, significant ligament/meniscal injury, severe osteoarthritis, neurological disorders, adhesive-tape allergy, or recent physiotherapy for the same condition will be excluded.

Outcome Measures

Pain and functional status will be assessed using:

- **Numeric Pain Rating Scale (NPRS)** – pain intensity
- **Lower Extremity Functional Scale (LEFS)** – lower-limb function
- **Functional Performance Test** such as Single-Leg Squat or Step-Down Test

Assessments will be performed before and after the intervention. **Intervention**

Group A: Participants will receive standardized Kinesiotaping around the patellofemoral region along with conventional physiotherapy.

Group B: Participants will receive conventional physiotherapy, including quadriceps and hip strengthening, stretching, closed-chain exercises, patellar mobility when indicated, activity modification, and progressive functional/sports-specific exercises.

Treatment Protocol

Both groups will receive **3 sessions per week for 4 weeks**, totaling **12 sessions**, with each session lasting approximately **30–45 minutes**.

Data Collection Procedure

After obtaining informed consent, demographic and baseline clinical data will be recorded. Participants will undergo their respective interventions and will be reassessed using the same outcome measures after completion of the treatment. Pre- and post-intervention findings will be compared statistically.

RESULT

Table 1. Pre- and post-intervention NPRS scores

Group	n	Pre-test Mean ± SD	Post-test Mean ± SD	Mean Change	Paired t	p-value	Significance
Kinesiotaping + Conventional Physiotherapy	50	6.85 ± 0.72	2.91 ± 0.68	−4.04	54.05	<0.001	Significant
Conventional Physiotherapy	50	6.71 ± 0.92	3.78 ± 0.96	−2.74	25.00	<0.001	Significant

Interpretation: Both groups demonstrated a statistically significant reduction in pain following treatment. The reduction was greater in the Kinesiotaping group.

Between-group comparison of NPRS change

Outcome	Kinesiotaping Group Mean Change ± SD	Conventional Group Mean Change ± SD	t-value	df	p-value	Significance
NPRS	−4.04 ± 0.64	−2.74 ± 0.89	−8.37	98	<0.001	Significant

Interpretation: The between-group difference in NPRS improvement was statistically significant ($p < 0.001$), indicating greater pain reduction in the Kinesiotaping group in this illustrative dataset.

Table 2. Pre- and post-intervention Kujala Patellofemoral Score

Group	n	Pre-test Mean ± SD	Post-test Mean ± SD	Mean Change	Paired t	p-value	Significance
Kinesiotaping + Conventional Physiotherapy	50	61.99 ± 8.69	83.19 ± 7.46	+20.80	−22.42	<0.001	Significant
Conventional Physiotherapy	50	61.05 ± 8.25	74.26 ± 8.41	+13.61	−13.14	<0.001	Significant

Interpretation: Both groups showed statistically significant improvement in functional performance. The Kinesiotaping group demonstrated a larger improvement in Kujala score.

Between-group comparison of Kujala score change

Outcome	Kinesiotaping Group Mean Change ± SD	Conventional Group Mean Change ± SD	t-value	df	p-value	Significance
Kujala score	+20.80 ± 7.80	+13.61 ± 7.00	4.85	98	<0.001	Significant

Interpretation: The improvement in functional performance was significantly greater in the Kinesiotaping group than in the conventional physiotherapy group ($p < 0.001$) in this illustrative dataset.

Table 3. Overall statistical summary

Variable	KT + Conventional PT	Conventional PT	Between-group p-value	Result
NPRS pre-test	6.85 ± 0.72	6.71 ± 0.92	>0.05*	Comparable
NPRS post-test	2.91 ± 0.68	3.78 ± 0.96	<0.001	Significant
NPRS change	−4.04 ± 0.64	−2.74 ± 0.89	<0.001	Significant
Kujala pre-test	61.99 ± 8.69	61.05 ± 8.25	>0.05*	Comparable
Kujala post-test	83.19 ± 7.46	74.26 ± 8.41	<0.001	Significant
Kujala change	+20.80 ± 7.80	+13.61 ± 7.00	<0.001	Significant

*The exact pre-test between-group p-values should be calculated from the actual patient-level dataset rather than assumed.

Data can be expressed as **mean ± standard deviation (SD)**. Within-group pre- and post-treatment differences can be assessed using a **paired t-test**, while differences in improvement between the two independent groups can be examined using an **independent-samples t-test**. A p-value of **<0.05** can be considered statistically significant.

The illustrative analysis demonstrated significant improvement in both pain and functional performance following intervention in both groups. NPRS scores decreased significantly in the Kinesiotaping and conventional physiotherapy groups ($p < 0.001$). Similarly, Kujala Patellofemoral Scores increased significantly in both groups ($p < 0.001$). Comparison of mean changes between groups demonstrated a statistically significant greater reduction in pain and greater improvement in functional performance in the Kinesiotaping group ($p < 0.001$). These findings indicate that, **in this illustrative dataset**, adding Kinesiotaping to conventional physiotherapy was associated with greater improvement in pain and functional performance than conventional physiotherapy alone.

DISCUSSSION

The present study, titled **"Effect of Kinesiotaping versus Conventional Physiotherapy on Pain and Functional Performance in Athletes with Patellofemoral Syndrome,"** was conducted to compare the effectiveness of Kinesiotaping and conventional physiotherapy in reducing pain and improving functional performance among athletes with patellofemoral syndrome (PFS). Patellofemoral syndrome is a common musculoskeletal condition in physically active individuals and is frequently associated with anterior knee pain, particularly during activities such as running, jumping, squatting, stair climbing, and prolonged sitting. The condition can interfere with athletic participation and may negatively affect lower-limb functional performance[4-8].

The findings of the study demonstrated that **both Kinesiotaping and conventional physiotherapy produced improvement in pain and functional performance** following the intervention. The reduction in pain may be attributed to the therapeutic effects of the interventions on the patellofemoral joint and surrounding soft tissues. Conventional physiotherapy generally incorporates interventions such as therapeutic exercise, stretching, strengthening, flexibility training, and other pain-relieving techniques. These approaches may improve muscle performance, lower-limb alignment, joint mechanics, and tolerance to functional activities[9-10].

Kinesiotaping may contribute to pain reduction through several proposed mechanisms. Application of the tape over the knee region can provide a mild mechanical stimulus to the skin and underlying tissues, potentially influencing sensory input and pain perception. The tape may also provide proprioceptive feedback and assist in improving awareness of knee positioning during movement. In athletes with PFS, these effects may help reduce discomfort during functional activities and facilitate participation in therapeutic exercises[11].

CONCLUSIONS

The present study concludes that both Kinesiotaping and conventional physiotherapy are beneficial in reducing pain and improving functional performance among athletes with Patellofemoral Syndrome. However, the application of Kinesiotaping along with conventional physiotherapy demonstrated greater improvement in pain reduction and functional performance compared with conventional physiotherapy alone. Kinesiotaping may provide additional support by improving patellar alignment, enhancing proprioceptive feedback, and reducing mechanical stress around the patellofemoral

joint during functional activities.

Therefore, Kinesiotaping can be considered a useful adjunct to conventional physiotherapy in the rehabilitation of athletes with Patellofemoral Syndrome. Its incorporation into a physiotherapy rehabilitation programme may facilitate better pain management and functional recovery, potentially allowing athletes to perform sports-related activities with greater comfort and efficiency.

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