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COMPARISON OF MANIPULATION AND MUSCLE ENERGY TECHNIQUE ON SACROILIAC JOINT DISABILITY AND LUMBAR MOBILITY IN SACROILIAC JOINT DYSFUNCTION

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KEYWORDS :

INTRODUCTION

Sacroiliac joint dysfunction (SIJD) is recognized as one of the major contributors to mechanical low back pain, accounting for nearly 15–30% of chronic low back pain cases reported in musculoskeletal practice. The sacroiliac joint (SIJ) acts as a critical link between the spine and lower extremities by transmitting forces generated during standing, walking, and lifting activities. Dysfunction of this joint can disturb normal biomechanics and lead to pain, reduced lumbar mobility, altered gait patterns, and functional disability. Despite its clinical importance, SIJD often remains underdiagnosed because its symptoms mimic lumbar disc pathology and other spinal disorders. [1]

The sacroiliac joint is anatomically unique and differs from most synovial joints of the body. It possesses both synovial and syndesmotic characteristics, allowing limited mobility while maintaining substantial stability. The anterior portion of the SIJ contains synovial fluid and articular cartilage, whereas the posterior portion is reinforced by strong ligamentous structures. This specialized arrangement enables efficient load transfer from the trunk to the pelvis while minimizing excessive movement that could compromise stability. [2]

Exercise therapy is commonly integrated with manual therapy interventions in the rehabilitation of SIJD. Stabilization exercises focusing on core musculature help improve force closure around the pelvis and enhance dynamic joint stability during movement. Strengthening exercises combined with stretching tight musculature may correct biomechanical imbalances and reduce recurrent stress on the sacroiliac joint. [24]

Research has demonstrated that combining manual therapy with stabilization exercises can produce superior outcomes compared to exercise programs alone. Manual therapy helps restore joint mobility and decrease pain, thereby allowing patients to perform strengthening exercises more effectively. Improved mobility and muscle activation following manual interventions may facilitate better rehabilitation progression and improved functional recovery. [25]

Although numerous studies support the use of manipulation and Muscle Energy Technique individually, limited evidence exists comparing their effectiveness specifically on sacroiliac disability and lumbar mobility among desk job professionals with SIJD. Considering the increasing prevalence of sedentary lifestyles and work-related musculoskeletal disorders, identifying the most effective conservative treatment approach is clinically important. Therefore, the present study aims to compare the effects of manipulation and Muscle Energy Technique on sacroiliac joint disability and lumbar mobility in individuals with sacroiliac joint dysfunction. [30]

Objectives of the Study

1. To evaluate the effectiveness of Manipulation on sacroiliac joint disability and lumbar mobility in sacroiliac joint dysfunction.
2. To evaluate the effectiveness of Muscle energy technique on sacroiliac joint disability and lumbar mobility in sacroiliac joint dysfunction.
3. To compare the effectiveness of Manipulation and Muscle energy technique on sacroiliac joint disability and lumbar mobility in sacroiliac joint dysfunction.

METHODOLOGY

MATERIALS AND METHODS

Study Design: Pre-Post comparative study
Study Subjects: desktop professionals with sacroiliac joint dysfunction in 30-50 years of age group
Sample Size: 32 (16 per group)

Sample Size Calculation

Sample size was estimated using the standard deviation of modified Schober's test score in SI joint dysfunction as reported in the study conducted by Kulyapa Kenkampha et al.

$$N = 2 * \frac{\left[Z\left(1-\frac{\alpha}{2}\right)+Z\left(1-\beta\right)\right]^2 * \sigma^2}{d^2}$$

The estimated sample size is 16 in each group.

Sampling Method: Chit method Random sampling.
Study Setting and Source of Data: Florence college of Physiotherapy OPD
Study Duration: 6 months

Sample Selection

Inclusion Criteria: [17,21]

- Desk job professionals aged between 30–50 years.
- Both male and female participants.
- Individuals experiencing sacroiliac joint pain for more than 3 months.
- Participants diagnosed with sacroiliac joint dysfunction based on positivity of at least 3 out of the following 5 provocative tests: Vorlauf test, Gillet test, Irritation point tenderness positivity, Posterior shear test, Compression test

Exclusion Criteria: [17,21]

- History of recent musculoskeletal injury or surgery involving the spine, pelvis, shoulder, or lower extremities.
- Presence of neurological disorders affecting posture, balance, or movement.
- Diagnosed rheumatological or inflammatory joint disorders.
- Individuals with vascular impairments affecting the lower limbs or spine.

Methods of Data Collection

- Ethical Clearance was obtained from the ethical committee of Florence College of Physiotherapy.

Group A (SIJ Manipulation+ Exercises)

- Participants allocated to Group A received sacroiliac joint manipulation along with a standardized exercise program for a duration of four weeks. The intervention was administered twice weekly under the supervision of a physiotherapist. Prior to the treatment session, participants were assessed for pain, sacroiliac joint dysfunction,

and lumbar mobility using standardized outcome measures.

Group B (Muscle Energy Technique + Exercise)

- Participants allocated to Group B received Muscle Energy Technique (MET) along with a standardized exercise program for a duration of four weeks, administered twice weekly under the supervision of a physiotherapist. Before initiating the intervention, participants were assessed for sacroiliac joint dysfunction, lumbar mobility, and disability using standardized outcome measures. The procedure was explained clearly to each participant, and they were instructed to remain relaxed and actively cooperate during the treatment session. MET was performed based on the identified pelvic dysfunction, including anterior or posterior innominate rotation, with the aim of restoring normal sacroiliac joint mechanics, reducing pain, and improving lumbar mobility. [16,17,20]

Data Analysis

Table – 5 Pre and Post Test Comparision of Modified Schobers Test Scores for Lumbar Extension Within Group A and B

Groups	Pre- Test		Post Test		t - test	Significance
	Mean (cm)	S.D	Mean (cm)	S.D		
Group- A	3.10	±0.109	2.65	±0.131	18.41	.001**
Group- B	3.11	±0.083	2.05	±0.131	28.63	.001**

This table shows that there is no significant difference in pretest values of lumbar extension range within Group A(Manipulation) & Group B(MET) at $P > 0.05$, Hence both the groups are homogenous.

There is significant difference seen in posttest scores of Modified Schober's test within group A and group B at $P \leq 0.05$.

Table – 6 Pre-Test and Post Test Comparison of Dsijq Score Within Group – A and Group - B

Groups	Pre- Test		Post Test		t - test	Significance
	Mean (cm)	S.D	Mean (cm)	S.D		
Group- A	25.87	±1.31	18.25	±0.930	42.43	.001**
Group- B	25.93	±1.23	12.18	±0.981	95.26	.001**

This table shows that there is no significant difference in pretest values within Group A(Manipulation) & Group B(MET) at $P > 0.05$, Hence both the groups are homogenous.

There is significant difference seen in posttest DSIJQ scores within group A and group B at $P \leq 0.0$.

On comparing the Mean Values of Group A & Group B on Modified Schober's Test (Lumbar Flexion) Score, it shows a significant increase in the posttest mean values in both groups, but (Group B) shows 6.55 ± .200 which has the higher mean value is more effective than (Group A) 5.68 ± .268 at $P \leq 0.05$. Hence the null hypothesis is rejected.

On comparing the Mean Values of Group A & Group B on Modified Schober's Test (Lumbar Extension) Score, it shows a significant decrease in the posttest mean values in both groups, but (Group B) shows 2.05 ± .131 which has the lower mean value is more effective than (Group A) 2.65 ± .131 at $P \leq 0.05$. Hence the null hypothesis is rejected.

On comparing the Mean Values of Group A & Group B on DSIJQ Score, it shows a significant decrease in the posttest mean values in both groups, but (Group B) shows 12.18 ± .981 which has the lower mean value is more effective than (Group A) 18.25 ± .930 at $P \leq 0.05$. Hence the null hypothesis is rejected.

On comparing Manipulation and Muscle energy technique, the result showed significant improvements in Lumbar Flexion & Extension mobility and SI joint disability.

DISCUSSION

The present study titled "Comparison of Manipulation and Muscle Energy Technique on Sacroiliac Joint Disability and Lumbar Mobility in Sacroiliac Joint Dysfunction" was undertaken to compare the effectiveness of Manipulation and Muscle Energy Technique (MET) on lumbar mobility and sacroiliac joint disability among individuals with sacroiliac joint dysfunction. Thirty-two participants fulfilling the inclusion criteria were randomly allocated into two groups. Group A received Manipulation along with exercise therapy and Group B received Muscle Energy Technique along with exercise therapy. Lumbar mobility was assessed using Modified Schober's Test for flexion and extension, and functional disability was assessed using the Denver Sacroiliac Joint Questionnaire (DSIJQ). The intervention protocol was administered for a duration of four weeks.

The findings of the present study emphasize the importance of conservative physiotherapy management in individuals with sacroiliac joint dysfunction. Both Manipulation and Muscle Energy Technique, when combined with exercise therapy, were effective in improving lumbar mobility and reducing sacroiliac joint disability. However, Muscle Energy Technique demonstrated comparatively greater effectiveness in improving functional outcomes. The active nature of the technique, involvement of neuromuscular mechanisms, and restoration of muscular balance around the pelvis may have contributed to its superior effect.

The present study titled "Comparison of Manipulation and Muscle Energy Technique on Sacroiliac Joint Disability and Lumbar Mobility in Sacroiliac Joint Dysfunction" was conducted to compare the effectiveness of two commonly used manual therapy techniques in improving lumbar mobility and reducing sacroiliac joint disability among individuals with sacroiliac joint dysfunction.

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