COMPARISON OF STAR SHAPE TAPING
TECHNIQUE AND I-SHAPE TAPING
TECHNIQUE OVER ERECTOR SPINAE
MUSCLE IN PATIENTS WITH NON-SPECIFIC
LOW BACK PAIN AND ACTIVITY OF DAILY
LIVING

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Abstract: Objective of the study: Non-specific low back pain is very common problem and a worldwide pain syndrome that cause significant limitations in daily activities. Several types of tape and their associated application methods are available for different conditions. The purpose of the study was to observe how two taping techniques can help manage non-specific low back pain.

Aim: To compare the effects of “Star shaped taping technique” versus “I-shape taping technique over the erector spinae muscle” in patients with non-specific low back pain.

Method: Study was conducted on 30 patients with non-specific low back pain, divided into two groups randomly: I shape taping over erector spinae in group A and Star shape taping in group B. Patients were also stratified into three age groups [20-30, 30-40, 40-50] in which each group contains 10 patients. In each group, 5 patients received Star shape taping and 5 patients received I-Shape taping. The outcome of pain and disability was measured using the Mc Gill pain questionnaire, the Oswestry disability index and the Visual analogue scale (VAS). Both groups were compared for the mean difference.

Results: Patients in group A displayed a significant improvement than group B.

Conclusion: For the management of pain and disability in patients with non-specific low back pain, I-Shape technique is more effective than Star shape technique.

Keywords: Non-specific low back pain, Kinesio tape, Mc Gill pain questionnaire, Oswestry disability index, VAS.

CHAPTER-1

INTRODUCTION

Non-specific low back pain:

Non-specific low back pain is defined as global pain in lower back that is not due to any specific or known medical condition and that causes a decrease in muscle strength, endurance, performance, mobility, and ability to perform activities of daily living. Mechanical disorders such as lifting, carrying, are the main causes of Non-specific low back
pain. Additionally, non-mechanical factors such as infection, neoplasms, rheumatic, vascular, and gynecological factors have also been associated with Non-specific low back pain.

Non-specific low back pain has a prevalence of up to 84% and an activity limitation rating of 10-14%. Non-specific low back pain has become a leading cause of disability worldwide and imposes a significant economic burden on society. Chronic Non-specific low back pain refers to stiffness, tenderness and pain in the lumbosacral region that lasts for more than 12 weeks.

According to 21 studies, the prevalence of chronic low back pain in elderly people over 60 years of age is 21.7-68.3%, which predominates in women, and Non-specific low back pain achieved by activity limitation increases with age.

Taping is one of the rehabilitation methods that promotes the body’s natural healing process. It provides support and stability to muscles and joints without restricting free movements. It is used for a variety of musculoskeletal and neuromuscular problems.

The use of special elastic strips that imitate the density and elasticity of human skin. The strips will stretch longitudinally and the glue will be wavy allows the normal mechanical functioning of the skin. Tape does not contain latex, drugs or chemicals and is made from 100% cotton fiber and is temperature sensitive and water resistant.

It also promotes lymphatic drainage advanced rehabilitation is thought to be the effect of stimulated reactivation, proprioceptive training and movement reduction. Reduce pain, stimulation of correct movement patterns and reduce muscle imbalances. If so, the muscles become inflamed and the space between the skin and muscle becomes inflamed and narrowed and the outflow of lymphatic fluids or lymph flow becomes blocked or compromised.

Application of taping will widen the gap in your skin interstitial spaces that promotes lymph drainage, improve blood and lymph circulation, normalizes pressure on nociceptors support muscles and reduces pain and swelling.

Taping procedure is recommended for patients with lower back pain. The target muscle is secured to the patient’s skin under constant tension in an extended position. Tape was developed to stretch and extends vertically up to 140% of its resting length. Both the tape and the muscle are stretched simultaneously this will create convulsions as the skin lifts.

The convulsions support blood and lymph flow and reduces pain in patients with musculoskeletal disorders. Taping method manual says that proper stretch application is one of the most important factors for application success.

CHAPTER -2
LITERATURE REVIEW

REVIEW OF LITERATURE


2. Yilan Sheng, Zhouying DUAN. Kinesio taping in treatment of chronic non-specific low back pain: A systemic review and meta-analysis. Journal Rehabilitation Med 2019; 51: 734- 740. This meta-analysis demonstrated that KT, either separately or in combination with other general therapies, resulted in greater pain relief and improvement ADL in patients with chronic non-specific low back pain than did general physical therapies without KT.

3. Loredana Maggi, Claudia Celletti, Maurizio Mazzarini, David Blow. Neuromuscular taping for chronic non-specific low back pain: a randomized single-blind control trial. https://doi.org/10.1007/s40520-021-02029-0 This study sows that association of a standardized neuromuscular taping applications to back school therapy was seen to significantly improve functions and reduce pain with longer time efficacy.

4. Kin Trobec and Melita Persolja. Efficacy of kinesio taping in reducing low back pain: a comprehensive review. Journal of health sciences 2017;7(1):1-8. The effect of Kinesio taping in reducing low back pain is positive but was not statistically significant in analyzed studies. Taping therapy may therefore be used as a supplementary method to conventional physical therapy procedures and may be important for patients because of its easy accessibility and safety. Further studies are recommended to elucidate the effect Kinesio Taping on low back pain.
5. Patricia do Carmo Silva Parreira, Luciola da Cunha Mauricio Costa, Ricardo Takahashi. Do convulsions in kinesio taping matter? Comparison of two kinesio taping approaches in patients with chronic non-specific low back pain: protocol of a randomized trial. Journal of Physiotherapy 2013 Vol.59. This is the largest study aimed to investigate the hypothesized mechanism behind the kinesio taping application in patients with chronic low back pain. The results of this study will contribute to a better understanding about the mechanism of action of this widely applied therapeutic modality

CHAPTER 3

METHODOLOGY

Population:
Both male and female referred and diagnosed patient with non-specific low back pain in age group 20 to 50 years divided into 3 categories i.e. 20-30 years, 30-40 years and 40-50 years.

Sample size:
30 subjects.

Sample design:
Random sampling.

Research design:
Comparative experimental study design.

Inclusion criteria:
1. Referred and diagnosed non-specific low back pain patients.
2. Both male and females.
3. Age group of 20-50 years.
4. Patient with no radiculopathy.
5. Negative SLR test.

Exclusion criteria:
1. Neuromuscular conditions.
2. Patients on any other medication.
5. Spinal and disc pathologies.

Material used:
1. Crempire Kinesiology sports tape.
2. Scissor.

Outcome measures:
1. Mcgill pain questionnaire for pain.
2. Oswestry disability index questionnaire for ADL
3. Visual analogue scale (VAS).

Source of data:
School of Physiotherapy Abhilashi University.
Variables:
1. Independent variable- Pain.
2. Dependent variable- ADL.

Validity and reliability:
1. McGill pain questionnaire-
   R = 0.95
   McGill pain questionnaire is valid for non-specific low back pain.
2. Oswestry disability index questionnaire-
   R = 0.83-0.99
   Oswestry disability index questionnaire is valid to determine level of function associated with low back pain.
3. Visual analogue scale:
   R = 0.94
   Validity- VAS

Hypothesis:
- **Alternate Hypothesis:** There will be significant difference between the two taping techniques in non-specific low back pain.
- **Null Hypothesis:** There will be no significant difference between the two taping techniques in non-specific low back pain.

![Fig- 1: Crempire kinesiology tape](image-url)
Procedure:
Based on selection criteria 30 subjects were selected randomly and allotted in 2 groups A and B. A screening test will be done on both groups which involves taking a careful medical history and physical examination. Eligible patients will be informed about the study objectives and procedures and if they agree to participate in the study, they will sign a consent form. All subjects underwent allergic test before starting treatment. This allergy test consists of applying a small Crempire kinesiology sports tape patch over the skin. Patients will keep this patch on for 24 hours and will be instructed to remove the patch if any allergic reaction occurs. Eligible patients without allergic reaction to the patch test will be selected for the randomization and treatment.

Study will be conducted on referred and diagnosed cases in 30 patients with non-specific low back pain, divided into two groups randomly intervened with I-shape taping over erector spinae muscle in group A and star shape taping in group B.

**Group A** - I-shape taping over erector spinae muscle.

**Group B** - Star shape taping.

On the first day and at the end of the third day, patients in both groups were evaluated for pain and ADL.

Taping procedure:
**Group A:** I-shape taping over erector spinae muscle.

**Patient position** - Standing.

**Therapist position** - Standing behind the patient.

The procedure begins by placing the distal base of the of Crempire kinesiology sports tape approximately 2 inches (5cm) below the posterior superior iliac spine without tension and then remove the tape from the paper backing in only the amount required to begin the base application.

Subsequently, for each ‘I’ strip application, the patient will be asked to move the lumbar spine into flexion to position the erector spinae muscle in a stretched position. Then the tape should be applied over the skin with light tension (10-15% of available tension and creating convulsions in neutral), which is also known as “paper-off” tension. Once the distal base application is completed, tear the paper backing just below the base of the ‘I’ strip, leaving the paper backing on the strip. As the ‘I’ strip is applied in the skin, the tape is removed from the paper substrate using the ‘paper off’ tension (ie, 10-15% of available tension and creating convulsions in neutral).
Consequently, the tape application finishes by placing the proximal base of the kinesiology tape strip approximately 2 inches (5cm) above the vertebra T8 with 0% of tension and then rub the Kinesiology tape to initiate the glue adhesion. (As Shown in Fig-3).

![Fig-3: I-Shape Taping](image1)

Group B: Star shape taping technique.

Patient position- Prone lying.

Therapist position- At side of the patient.

The procedure begins by taking four I-strips, one vertical, one horizontal, and two at 45º angles.

The strips were applied with 15-25% tension, overlapping in a Star shape over the most painful point in the lower back.

The middle part of the strips was applied first, place it horizontally across the lower back.

Place the second strip vertically from the middle of the first strip, extending up towards the spine.

Repeat this process, alternating horizontal and vertical strips of tape, creating a Star-like pattern.

Apply gentle tension to the tape on the skin, ensuring no wrinkles or bubbles in the tape to ensure proper adhesion.

Once all the strips are in place, gently rub the tape to activate the adhesive and enhance its effectiveness. (As shown in Fig- 4).

![Fig-4: Star shape Taping](image2)
CHAPTER- 4

RESULT

T-TEST FOR OSWESTRY DISABILITY INDEX BETWEEN I-SHAPE AND STAR SHAPE TAPING (PRE-TREATMENT)

<table>
<thead>
<tr>
<th>Measure 1</th>
<th>Measure 2</th>
<th>t</th>
<th>df</th>
<th>p</th>
<th>Mean Difference</th>
<th>SE Difference</th>
</tr>
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<tbody>
<tr>
<td>I Shape taping</td>
<td>Star shape taping</td>
<td>0.940</td>
<td>14</td>
<td>0.363</td>
<td>2.533</td>
<td>2.694</td>
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</tbody>
</table>

Assumption Checks

<table>
<thead>
<tr>
<th></th>
<th>I Shape taping</th>
<th>W</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Star shape taping</td>
<td>0.949</td>
<td>0.510</td>
</tr>
</tbody>
</table>

Note. Significant results suggest a deviation from normality.

Descriptives

<table>
<thead>
<tr>
<th>Descriptives</th>
<th>N</th>
<th>Mean</th>
<th>Standard deviation</th>
<th>Standard error</th>
<th>Coefficient of variation</th>
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</thead>
<tbody>
<tr>
<td>I Shape taping</td>
<td>15</td>
<td>29.333</td>
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<td>Star shape taping</td>
<td>15</td>
<td>26.800</td>
<td>6.405</td>
<td>1.654</td>
<td>0.239</td>
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</table>
Table: - 1

T-TEST FOR MC GILL PAIN QUESTIONNARE BETWEEN I SHAPE AND STAR SHAPE (PRE-TREATMENT)

Paired Samples T-Test

<table>
<thead>
<tr>
<th>Measure 1</th>
<th>Measure 2</th>
<th>t</th>
<th>df</th>
<th>p</th>
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</thead>
<tbody>
<tr>
<td>I-Shape taping</td>
<td>Star shape taping</td>
<td>1.042</td>
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Descriptives

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<th>Coefficient of variation</th>
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</thead>
<tbody>
<tr>
<td>I</td>
<td>Shape taping</td>
<td>15</td>
<td>49.400</td>
<td>2.035</td>
</tr>
<tr>
<td>Star shape taping</td>
<td>15</td>
<td>46.000</td>
<td>8.452</td>
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Assumption Checks

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<tr>
<td>I Shape taping - Star shape taping</td>
<td>0.972</td>
<td>0.882</td>
</tr>
<tr>
<td>I Shape taping - Star shape taping</td>
<td>0.972</td>
<td>0.882</td>
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</tbody>
</table>

Note. Significant results suggest a deviation from normality.

Table: - 2

T-TEST FOR VAS BETWEEN I SHAPE AND STAR SHAPE (PRE-TREATMENT)

Paired Samples T-Test

<table>
<thead>
<tr>
<th>Measure 1</th>
<th>Measure 2</th>
<th>t</th>
<th>df</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>I Shape taping</td>
<td>Star shape taping</td>
<td>0.807</td>
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<td>0.433</td>
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Assumption Checks

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<td>I- Shape taping - Star shape taping</td>
<td>0.921</td>
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Note. Significant results suggest a deviation from normality.
Descriptives

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<th>SD</th>
<th>SE</th>
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<tbody>
<tr>
<td>I SHAPE</td>
<td>15</td>
<td>5.867</td>
<td>1.246</td>
<td>0.322</td>
<td>0.212</td>
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<tr>
<td>STAR HSAPE</td>
<td>15</td>
<td>5.467</td>
<td>1.506</td>
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Table: -3

T-TEST FOR OSWESTRY BETWEEN I-SHAPE AND STAR SHAPE

(POST TREATMENT)

Paired Samples T-Test

<table>
<thead>
<tr>
<th>Measure 1</th>
<th>Measure 2</th>
<th>t</th>
<th>df</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>I Shape</td>
<td>- Star shape</td>
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<td>14</td>
<td>0.961</td>
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Assumption Checks

Test of Normality (Shapiro-Wilk)

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<tbody>
<tr>
<td>I Shape</td>
<td>0.838</td>
<td>0.012</td>
</tr>
<tr>
<td>- Star shape</td>
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</table>

Note. Significant results suggest a deviation from normality.

Descriptives

<table>
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<tr>
<th></th>
<th>N</th>
<th>Mean</th>
<th>Standard deviation</th>
<th>Standard error</th>
<th>Coefficient of variation</th>
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</thead>
<tbody>
<tr>
<td>I Shape</td>
<td>15</td>
<td>15.733</td>
<td>8.614</td>
<td>2.224</td>
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<tr>
<td>Star shape</td>
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<td>15.600</td>
<td>6.555</td>
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Table: -4
T-TEST FOR McGill Pain Questionnaire Between I-Shape and Star Shape (Post-treatment)

Assumption Checks

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<td>Measure 1</td>
</tr>
<tr>
<td>I Shape</td>
</tr>
<tr>
<td>I Shape</td>
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Note. Significant results suggest a deviation from normality.

Descriptives

<table>
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<tbody>
<tr>
<td>N</td>
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<tr>
<td>----</td>
</tr>
<tr>
<td>I Shape</td>
</tr>
<tr>
<td>Star shape</td>
</tr>
</tbody>
</table>

Table: - 5
T-TEST FOR VAS BETWEEN I-SHAPE AND STAR SHAPE

(POST TREATMENT)

Paired Samples T-Test

<table>
<thead>
<tr>
<th>Measure 1</th>
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<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>I Shape</td>
<td>- Star shape</td>
<td>-0.617</td>
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Assumption Checks

Test of Normality (Shapiro-Wilk)

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Note. Significant results suggest a deviation from normality.

Descriptives

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<th>Mean</th>
<th>Standard deviation</th>
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<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>I Shape</td>
<td>15</td>
<td>3.333</td>
<td>1.345</td>
<td>0.347</td>
<td>0.404</td>
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<tr>
<td>Star shape</td>
<td>15</td>
<td>3.667</td>
<td>1.345</td>
<td>0.347</td>
<td>0.367</td>
</tr>
</tbody>
</table>

Table- 6
In Fig-5: Pre-treatment: Mean, SD, CV, Post-treatment: Mean, SD, CV

Fig-6: Pre-treatment: Mean, SD, CV, Post-treatment: Mean, SD, CV
In Fig-7: Pre-treatment: Mean, SD, CV, Post-treatment: Mean, SD, CV

In Fig-8: Pre-treatment: Mean, SD, CV, Post-treatment: Mean, SD, CV
CHAPTER 5

DISCUSSION

The aim of study is to observe the comparison between Star shape taping and I Shape taping over erector spinae in patients with non-specific low back pain and activity of daily living. Thirty patients took part in the study, 15 in group A and 15 patients in group B. Group A patients provided with I-Shape taping and group B patients provided with Star shape technique. The outcome of pain and disability was measured using the Mc Gill pain questionnaire, the Oswestry disability index and the Visual analogue scale (VAS).

In Star shape Oewestry pain questionnaire, Pre-treatment- (Mean ± Standard Deviation) is (29.333 ± 9.788), W=0.949 and Post-treatment- (15.733±8.61), W=0.838, P=0.012. In Mc Gill pain questionnaire, Pre-treatment- (49.400 ± 7.881), W=0.972 and Post-treatment- (34.467±5.553), W=0.924, P=0.225. In VAS, Pre-treatment- (5.867 ± 1.246), W=0.921 and Post-treatment- (3.333 ± 1.345) W=0.905, P= 0.112.

In I Shape taping, Oswestry pain questionnaire, Pre-treatment- (Mean ± Standard Deviation) is (29.333 ± 9.788), W=0.949 and Post-treatment- (15.733±8.61), W=0.838, P=0.012. In Mc Gill pain questionnaire, Pre-treatment- (46.000 ± 8.452), W=0.972 and Post-treatment- (33.933 ± 6.123), W=0.924, P=0.225. In VAS, Pre-treatment- (5.467 ± 1.506), W=0.921 and Post-treatment- (3.667 ± 1.345), W= 0.905, P= 0.112. The paired t-test results indicated significant differences between pre and post treatment scores for both techniques, with I-Shape technique showing larger t-values and greater percentage changes. The coefficient of variation (CV) values indicated moderate to high variability in the data, but I-Shape
technique had a larger reduction in CV compared to Star Shape technique. At the end of the treatment program both the groups showed decrease in pain and disability. Statistical analysis showed that I-Shape taping technique is more effective than Star shape taping technique.

CHAPTER 6
CONCLUSION

This study compared the effectiveness of two taping techniques, I-Shape and Star Shape, in reducing pain and improving functional ability in patients with chronic low back pain. The results showed that both techniques significantly reduced pain and improved functional ability, but I-Shape technique had a greater reduction in pain and functional ability compared to Star Shape technique.

CHAPTER 7
CLINICAL SIGNIFICANCE

I-Shape technique as a preferred treatment it improves pain, enhances functional ability, and is non-invasive and cost-effective treatment and also will be useful in sports athletes.

CHAPTER 8
LIMITATIONS AND FUTURE SCOPE OF STUDY

LIMITATIONS:

The study had a relatively small sample size, which may not be representative of the larger population of patients with chronic low back pain.

FUTURE SCOPE:

Investigate the potential benefits of combining the I-Shape and Star Shape techniques with exercise, electrotherapy etc.

Compare the effectiveness of the I-Shape and Star Shape techniques with other established techniques for managing non-specific low back pain.

Conduct a long-term follow-up study to evaluate the sustainability of the benefits of the I-Shape and Star Shape techniques.

CHAPTER 9
REFERENCES

REFERENCES


