Turk J Phys Med Rehab 2025;71(3):274-283
DOI: 10.5606/tftrd.2024.15545
Available online at www.turkishjournalpmr.com

Original Article

Exercise and two different kinesio taping techniques in patients with sacroiliac joint dysfunction: A randomized controlled trial

Birkan Sonel Tur[1], Derya Karacif[1], Saime Ay[2], Derya Gökmen[3], Elif Can Ozdemir[1], Deniz Evcik[4]

[1]Department of Physical Medicine and Rehabilitation, Ankara University Faculty of Medicine, Ankara, Türkiye
[2]Department of Physical Medicine and Rehabilitation, Ufuk University Faculty of Medicine, Ankara, Türkiye
[3]Department of Biostatistics and Informatics, Ankara University Faculty of Medicine, Ankara, Türkiye
[4]Department of Physical Medicine and Rehabilitation, Güven Hospital, Ankara, Türkiye

ABSTRACT

Objectives: The study aimed to compare the effectiveness of home exercise and two different kinesio taping (KT) techniques applied in addition to home exercise in patients with sacroiliac joint dysfunction (SIJD).

Patients and methods: This three-arm, randomized controlled trial was conducted with 99 patients (84 females, 15 males; mean age: 27.1±10.7 years; range, 18 to 64 years) with SIJD between December 1, 2016, and July 20, 2024. The patients were randomized into one of the three groups: home exercise group (n=33), ligament correction KT group (n=33), and lymphatic correction KT group (n=33). The KT groups were also given a home exercise program. The pain intensity and patient global assessments were conducted using a 10-cm Visual Analog Scale. The disability level was assessed using the Oswestry Disability Index. Assessments were performed at baseline (T1), four weeks (T2), and eight weeks (T3).

Results: In the home exercise group, there was no significant change in pain levels at rest over time. Significant improvements were found in other parameters in all groups. The pain level at rest was significantly reduced at the T1-T2 interval in the lymphatic correction KT group compared to the home exercise group. At the T1-T3 interval, both KT groups showed a statistically significant reduction in pain at rest compared to the home exercise group. Both KT groups showed a statistically significant improvement in disability compared to the home exercise group.

Conclusion: In the treatment of SIJD, both KT techniques added to the home exercise program were more effective on pain, patient global assessment, and disability than the home exercise program alone.

Keywords: Exercise, kinesio taping, pain, sacroiliac joint.

Sacroiliac joint dysfunction (SIJD) is an important cause of low back pain. The prevalence of SIJD in adult patients with chronic low back pain is approximately 25%.[1] The pain associated with SIJD is usually unilateral, sharp, dull, and shooting. Patients with SIJD may present with pain localized in or immediately inferomedial to the posterior superior iliac spine or along the gluteal region, lateral buttocks, lower extremities, and groin.[2]

There is no clear, standardized approach to the diagnosis of SIJD. The diagnosis is based on a clinical evaluation of pain localization, patient posture, and movement, as well as pain provocation tests and motion palpation tests.[3]

The occurrence or increase in pain as a result of the stress applied to the sacroiliac joint with the maneuvers performed is considered a positive result.[4] Motion palpation tests are used to detect motion asymmetry or hypomobility in the sacroiliac joints. However, it has been reported that motion palpation tests are less reliable than pain provocation tests in the diagnosis of SIJD and that interrater agreement is low.[5] Consequently, it is recommended that tests be employed in conjunction to diagnose SIJD.

Corresponding author: Deniz Evcik, MD. Güven Hastanesi, Fiziksel Tıp ve Rehabilitasyon Kliniği, 06540 Çankaya, Ankara, Türkiye.
E-mail: evcikd@yahoo.com

Received: July 23, 2024 **Accepted:** September 23, 2024 **Published online:** November 14, 2024

Presented as an oral presentation at the 9th Medical Rehabilitation Congress, October 26-29, 2024, Antalya, Türkiye.

Cite this article as: Sonel Tur B, Karacif D, Ay S, Gökmen D, Can Ozdemir E, Evcik D. Exercise and two different kinesio taping techniques in patients with sacroiliac joint dysfunction: A randomized controlled trial. Turk J Phys Med Rehab 2025;71(3):274-283. doi: 10.5606/tftrd.2024.15545.

The treatment of SIJD is primarily conservative. Treatment options include medical therapy, self-correction maneuvers, manipulation and mobilization, kinesio taping (KT), muscle energy techniques, and exercises.[6] There is evidence of the medium- and long-term benefits of exercise programs.[7,8] The most commonly recommended exercises are SIJ correction exercises, piriformis stretching, gluteus maximus stretching, gluteus medius and minimus stretching, isometric hip muscle strengthening exercises, abdominal and pelvic floor muscle strengthening exercises, and lumbar exercises.[6,9]

Kinesio taping is a noninvasive method used to treat musculoskeletal problems. Recently, KT has attracted much attention, and it is used safely. In a meta-analysis investigating the effectiveness of evidence-based physical therapy approaches in SIJD, it has been stated that the treatment approach combining KT and exercise therapy is more effective in the management of pain and disability than the traditional treatment combining electrotherapy and exercise therapy.[10]

Kinesio taping can be applied with different techniques, and the techniques applied aim to improve blood and lymphatic circulation, reduce pain, muscle tension, and inflammation, increase neuromuscular retraining, accelerate healing, and prevent injury.[11] However, there is a lack of consensus in the literature on the optimal use of KT in the treatment of SIJD.

The ligament correction technique is used to increase stimulation around the ligament. This method increases the stimulation of mechanoreceptors. The band tension should be between 50 and 75%.[12] The lymphatic correction technique is applied to regulate the impaired lymphatic circulation. By removing the surface skin, the pressure on the lymph vessels is reduced. Thus, a space is created that allows circulation in the tissue. In addition, with this method, the efficiency of the deeper lymphatic flow is increased by ensuring maximum contraction and relaxation of the muscles.[13] There is also a theory that lifting the skin severs the filaments that connect the skin to the endothelial cells of the lymphatic and capillary beds, thus creating channels through which lymphatics can drain. It is suggested that this allows more blood flow to the area.[14] This technique is also called the circulatory correction technique.

Sacroiliac joint dysfunction can occur due to acute trauma, chronic repetitive shear or torsional forces applied to the sacroiliac joint, and ligamentous tension.[15] When KT is applied over the sacroiliac joint with the lymphatic correction technique, the skin is lifted, and consequently, the muscles, fascia, ligaments, and lymphatic vessels are subjected to less compression. Thus, lymphatic circulation is restored, and microcirculation improves. In this way, it is thought to be effective in the treatment of SIJD by increasing the healing of the structures surrounding the sacroiliac joint. A review of the literature revealed no studies that compared the effectiveness of these two methods in the treatment of SIJD. This study aimed to assess the efficacy of the ligament correction technique or lymphatic correction technique in addition to a home exercise program in patients with SIJD.

PATIENTS AND METHODS

The three-arm, randomized controlled trial was conducted with 99 patients (84 females, 15 males; mean age: 27.1±10.7 years; range, 18 to 64 years) with SIJD who admitted to the physical medicine and rehabilitation outpatient clinics of the Ufuk University Faculty of Medicine and Ankara University Faculty of Medicine between December 1, 2016, and July 20, 2024. The diagnosis of SIJD was made in the presence of pain that was localized between 3 cm above and 10 cm below the spina iliaca posterior superior and was positive in three of the pain provocation tests.[16] Pregnancy, inflammatory rheumatic disease, inflammatory sacroiliitis, polyarthrosis, lumbar disc herniation, severe symptomatic disc degeneration, spondyloarthrosis, history of spinal or pelvic trauma, metabolic bone disease, infection, malignancy, open wounds in the lumbar and sacral regions, patients who received medication in the previous three months, patients who received physiotherapy, exercise, injections, KT, or surgical treatment in the previous six months were excluded. The study protocol was approved by the Human Research Ethics Committee of Ufuk University (Protocol no: 15.11.2016-5) and registered on the clinicaltrials.gov website (NCT04829513). All participants signed a written informed consent form before any data collection. The study was conducted in accordance with the principles of the Declaration of Helsinki.

Block randomization was performed by an independent researcher. The randomization schedule was generated using a web application (http://www.randomization.org). Participants were

allocated to three different groups: the home exercise group, the ligament correction KT group, and the lymphatic correction KT group.

All three groups were given a home exercise program involving flexibility and strengthening of the lower back, hip girdle, and sacroiliac region. These exercises were first demonstrated by a physiotherapist at the hospital, and they were asked to perform the exercises at home for four weeks using illustrated forms. The exercise compliance of the patients was reviewed at four weeks. If patients with poor exercise compliance were identified, they were excluded from the study.

Kinesio taping was conducted by physical medicine and rehabilitation specialists who completed KT training and with more than five years of experience with KT. During ligament correction KT, the patient leaned slightly forward. The first I band was applied horizontally on the bilateral sacroiliac joint with 50 to 75% tension. Both ends were applied without tension. The second I band, approximately 10 cm in length, was applied diagonally to one sacroiliac joint with 75% tension and without tension at the ends. The third I band was applied to the other sacroiliac joint in the same way.[17-19] The KT was repeated three times, once a week. After the tape was adhered, it was allowed to remain for five days (Figure 1).

In lymphatic correction KT, the base of the kinesio fan strip was placed approximately 7 cm above the sacroiliac joint along the spinous processes with the patient's spine in neutral position. The patient was allowed to flex forward by turning to the opposite side of the painful joint. The tails of the fan strip were angled 45° inward over the sacroiliac joint and terminated near the top of the gluteus maximus. A very light tension (15 to 25%) was applied. The second kinesio fan strip was placed approximately 7 cm inferior to the sacroiliac joint along the spinous processes with the patient's spine in neutral position. The tails of the fan strip were angled 45° upward over the sacroiliac joint and terminated near the superior aspect of the posterior superior iliac spine.[18,20] The KT was repeated three times, once a week. After the tape was adhered, it was allowed to remain for five days (Figure 2).

The sociodemographic information of the patients was recorded. Pain intensity in the last week and pain levels at rest and during movement were measured using the Visual Analog Scale (VAS). The VAS was scored from 0 to 10 cm (0=no pain, 10=most severe pain experienced). Patient global self-assessment in the last week was performed with VAS scored from 0 to 10 cm (0=very good, 10=very poor).

The Oswestry Disability Index (ODI) was used to determine the level of disability. The validity and reliability of this scale in sacroiliac joint issues and treatment has been demonstrated.[21] The ODI is an assessment form that questions how much the person's life is affected while performing daily activities. It consists of 10 subgroups, and each section contains six questions. Each section is scored between 0 and 5. The subgroups question pain intensity, self-care, lifting and carrying, walking, sitting, standing, sleeping, sexual life, travelling, and social life. The degree of disability is quantified on a scale of 0 to 100. As the total score increases, the level of disability also increases. The Turkish validity and reliability of the scale have been demonstrated.[22]

Assessments were performed before treatment (T1), after treatment (4th week; T2), and four weeks after the end of treatment (8th week; T3).

Figure 1. Ligament correction technique.

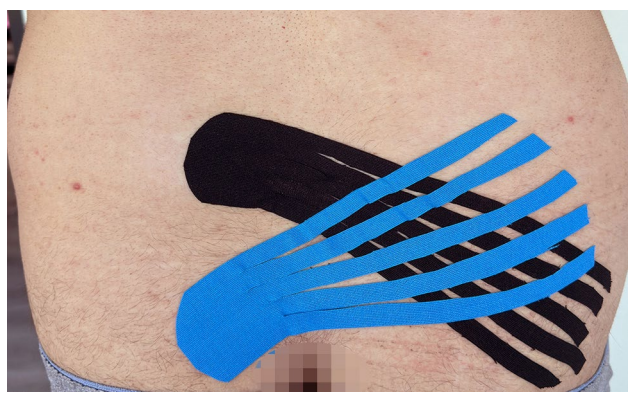

Figure 2. Lymphatic correction technique.

TABLE 1
Comparisons of sociodemographic and clinical features of the study groups

	Group 1 (n=33)					Group 2 (n=33)					Group 3 (n=33)					
	n	%	Mean±SD	Median	Min-Max	n	%	Mean±SD	Median	Min-Max	n	%	Mean±SD	Median	Min-Max	*p*
Age (year)			27.7±12.0					27.5±9.9					26.3±10.6			0.859
Sex																0.192
Male	6					7					2					
Female	27					26					31					
Education level																0.167
Primary school	6					1					2					
Secondary school	2					5					3					
University	25					27					28					
Marital status																0.650
Married	22	66.7				22	66.7				28	75.8				
Duration (month)			5.8±4.4	4	1-15			3.9±3.3	3	1-12			4.8±4.1	3	1-16	0.176
Affected side																0.088
Right	17					11					18					
Left	14					22					15					
Bilateral	2					0					0					

SD: Standard deviation.

Examinations and assessments were performed by physical medicine and rehabilitation specialists. Patients were not allowed to use painkillers during the study period. Side effects were recorded.

Statistical analysis

The required sample size was determined using G*Power version 3.1.9.7 software (Heinrich-Heine-Universität Düsseldorf, Düsseldorf, Germany), considering an effect size of 0.32 (medium) for the comparison of three independent groups with the analysis of variance. The total required sample size was calculated as 99 (33 participants in each group), with an alpha of 0.05 and power of 0.80.

Categorical variables were expressed as frequency (percentage), while continuous variables were presented as mean ± standard deviation (SD) or median (min-max). The Friedman test was used to evaluate the differences between repeated measurements on a group basis. One-way analysis of variance (Kruskal-Wallis variance analysis) was used to compare more than two independent groups regarding continuous variables, while the chi-square test was performed to compare more than two independent groups regarding categorical variables. Dunn's test was performed after the Kruskal-Wallis test. A p-value <0.05 was considered statistically significant.

RESULTS

Table 1 presents the sociodemographic and clinical characteristics of the patients, as well as a comparison of the groups. The flowchart is presented in Figure 3. None of the patients had to discontinue treatment due to noncompliance with exercises or KT. No adverse events occurred. In all groups, statistically significant changes were found in pain during movement, patient global assessment, and ODI at T2 and T3 compared to T1. However, pain at rest did not show a significant change in the home exercise group (p=0.068), while a significant decrease was found in the other two groups (p=0.0001). Within-group comparisons are detailed in Table 2.

The VAS score at rest showed a difference between the groups between T1 and T2, as well as T1 and T3 (p=0.037 and p=0.004, respectively). A significant difference was found between the lymphatic correction KT group and the home exercise group between T1 and T2 (p=0.035). A statistically significant difference was found in both the lymphatic correction KT and ligament

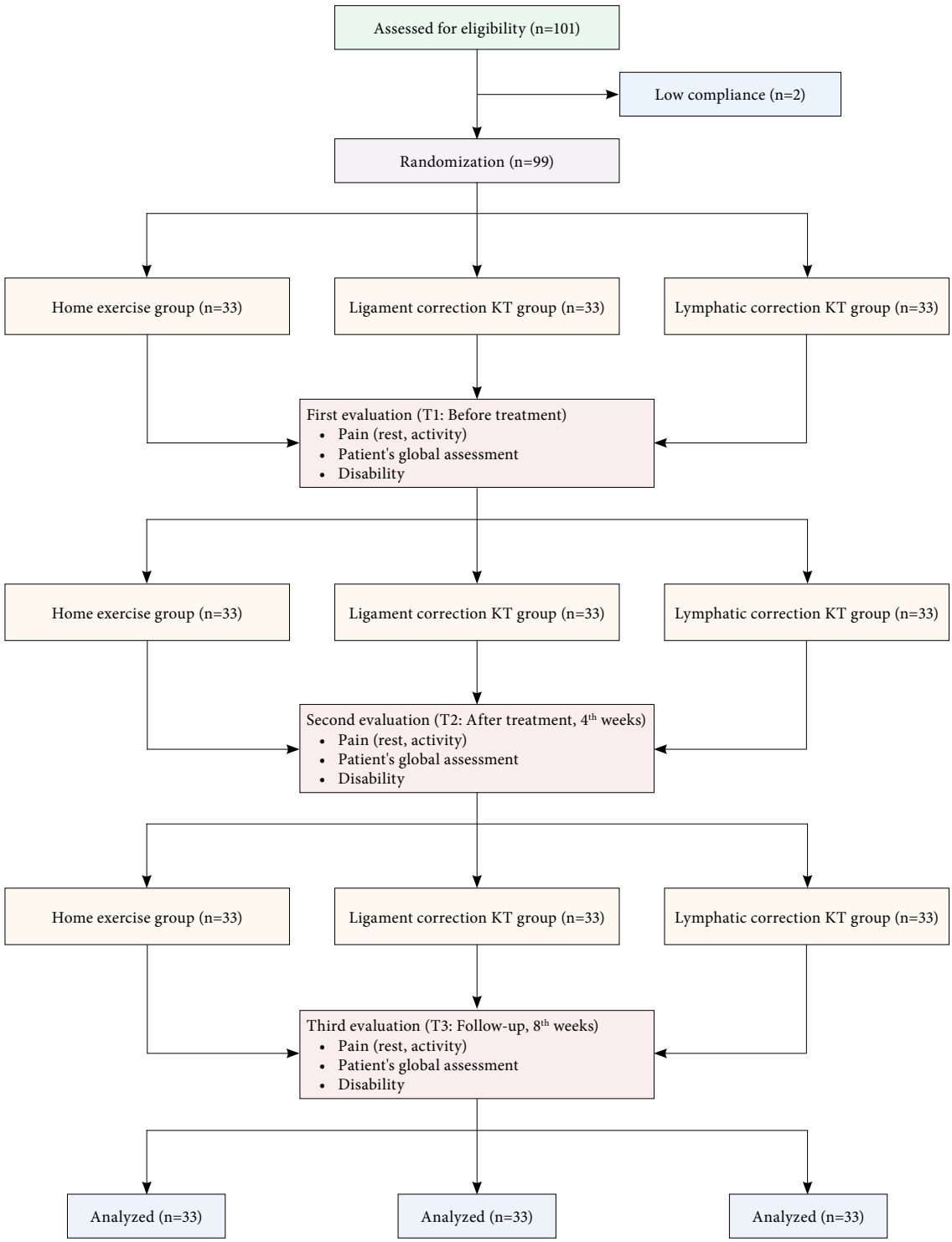

Figure 3. Participant flowchart.

KT: Kinesio taping. All three groups were given a home exercise program.

correction KT groups compared to the home exercise group between T1 and T3 (p=0.009 and p=0.014, respectively).

There was no difference between the groups in pain during movement and patient global assessment. There was a difference in ODI scores between the groups.

TABLE 2
Within-group comparisons of the study groups

	Group 1 (n=33)		Group 2 (n=33)		Group 3 (n=33)	
	Median	Min-Max	Median	Min-Max	Median	Min-Max
Pain at rest VAS (0-10)						
T1	3	0-8.4	4	0-7	4	1-9.2
T2	4	0-8	3	0-8	2	1-5
T3	3	0-8	2	0-6	3	0-9
p	NS, p=0.068		0.0001		0.0001	
p (T1-T2)			0.0001		0.001	
p (T1-T3)			0.0001		0.0001	
Pain during movement VAS (0-10)						
T1	5	1-8.7	7	0-10	5	0-10
T2	3.5	1-8.5	4	0-8	3	0-7
T3	4	1-8.7	4	0-8	3	1-9
p	0.0001		0.0001		0.0001	
p (T1-T2)	0.001		0.005		0.002	
p (T1-T3)	0.001		0.0001		0.0001	
Patient global assessment (0-10)						
T1	6	0-9	5	1-10	5	1-10
T2	4	0-9	3	0-6.1	3	0-7
T3	3	0-9	3	0-6.2	2	0-8
p	0.0001		0.0001		0.0001	
p (T1-T2)	0.017		0.0001		0.003	
p (T1-T3)	00001		0.0001		0.0001	
Oswestry disability index (0-100%)						
T1	20	10-66	30	12-62	32	2-66
T2	18	6-56	20	2-50	16	6-54
T3	16	6-52	16	0-56	14	2-58
p	0.0001		0.0001		0.0001	
p (T1-T2)	0.017		0.0001		0.0001	
p (T1-T3)	0.0001		0.0001		0.0001	

VAS: Visual Analog Scale; NS: Not significant; T1: Before treatment; T2: After treatment (4th week); T3: Follow-up (8th week); *p* values from Friedman test.

In both KT groups, there was a statistical difference between T1 and T2, as well as T1 and T3, compared to the home exercise group (p=0.001; Table 3).

DISCUSSION

To the best of our knowledge, this is the first study to evaluate the effects of a home exercise program and ligament correction or lymphatic correction KT added to a home exercise program in the treatment of SIJD. According to the results of this study, although all three treatments were effective, KT applications added to the home exercise program were found to be more effective than home exercise alone.

One of the most common symptoms in patients with SIJD is pain localized in the posterior superior iliac spine or immediately inferomedial to it.[4] Since pain can severely affect activities of daily living, it is generally the first and often the only parameter evaluated in studies. However, it should not be forgotten that pain is subjective. The evaluation of this assessment as realistically as possible is still a subject of research. Patients with SIJD may have different pain experiences. In SIJD, pain is more pronounced

TABLE 3
Percentage changes in values of parameters in groups in T1-T2 and T1-T3 time intervals

	Group 1 (n=33)		Group 2 (n=33)		Group 3 (n=33)		
	Median	Min-Max	Median	Min-Max	Median	Min-Max	*p**
Pain at rest, VAS T1-T2 (0-10)	–14.0	–100 - 200	–33.3	–100 - 166.7	–33.3	–68 - 100	**0.037**
Group 1 *vs.* Group 2							NS
Group 1 *vs.* Group 3							0.035**
Group 2 *vs.* Group 3							NS
Pain at rest, VAS T1-T3 (0-10)	0	–75 - 200	–33.3	–96 - 0	–50	–100 - 200	**0.004**
Group 1 *vs.* Group 2							0.014**
Group 1 *vs.* Group 3							0.009**
Group 2 *vs.* Group 3							NS**
Pain during movement, VAS T1-T2 (0-10)	–20.0	–85.7 - 50	–16.7	–75 - 200	–33.3	–100 - 50	0.160
Pain during movement, VAS T1-T3 (0-10)	–28.6	–75 - 100	–40	–100 - 300	–40	–85.7 - 50	0.054
Patient global assessment T1-T2 (0-10)	–14.28	–75 - 100	–37.5	–100 - 0	–38.7	–100 - 500	0.179
Patient global assessment T1-T3 (0-10)	–22.2	–70 - 50	–33.3	–100 - 33.3	–40	–100 - 700	0.333
Oswestry disability index T1-T2 (0-100%)	14.29	–60 - 57.1	33.3	0 - 85.7	35.29	–200 - 80.9	**0.0001**
Group 1 *vs.* Group 2							0.002**
Group 1 *vs.* Group 3							0-001**
Group 2 *vs.* Group 3							NS**
Oswestry disability index T1-T3 (0-100%)	20	–50 - 70	52.38	–7.7 - 100	38.09	–19 - 87.5	**0.001**
Group 1 *vs.* Group 2							0.001**
Group 1 *vs.* Group 3							0.018**
Group 2 *vs.* Group 3							NS**

SD: Standard deviation; VAS: Visual Analog Scale; NS: Not significant; T1: Before treatment; T2: After treatment (4th week); T3: Follow-up (8th week); * Results from Kruskal-Wallis test; ** Results from Dunn test.

during movement than at rest. Standing up from a sitting position, climbing stairs, bending, twisting, running, climbing, and prolonged walking may increase pain.[23] Therefore, in our study, pain levels at rest and during movement were evaluated separately. In our study, both KT methods applied together with the home exercise program were found to be effective in pain at rest and during movement. Similarly, another study evaluated pain at rest and during movement. In this study on 50 pregnant patients with SIJD, one group was assigned KT with the ligament correction technique once a week for five weeks, and one group was assigned sham KT. At the end of the fifth week, there was a significant improvement in resting and movement VAS scores in the ligament correction KT group.[24] The most important difference between this study and our study is that it was conducted in pregnant women. Pregnant women and women in the postpartum period were excluded from this study, thereby eliminating the effects of pregnancy-related hormonal changes on the sacroiliac joint. The effects of hormonal changes on the ligaments in these patients may have differed from those in nonpregnant patients with SIJD. However, considering the limitations of treatment in pregnant patients, KT may be an important treatment approach in SIJD. When this study and other studies in the literature are evaluated, it is observed that KT was applied for a shorter period of time in our study. We believe that increasing the duration and frequency of KT application would yield a difference in pain during movement between the KT and home exercise groups.

Patient global assessment has recently gained popularity in studies. In our study, significant improvement was observed in the patient global assessment score in all three groups, but no difference was found between the groups. This significant improvement in patient global assessment in all

three groups may be related to the reduction of pain at rest in the home exercise group and pain during movement and rest in the KT groups. In addition, we believe that the significant decrease in the level of disability in the patients may have caused them to feel better.

The personal, societal, and global burden of SIJD-related disability is high due to the relatively high prevalence of SIJD among patients evaluated for low back pain, the insufficient recognition and undertreatment of SIJD, and the fact that SIJD affects a wide range of ages.[25] It is clear that reducing disability with the treatments applied in this patient group has personal and social benefits. The ODI was shown to be a valid measurement tool for the assessment of disability associated with sacroiliac joint pain.[26] In our study, which included a wide age group and both male and female patients, we investigated the effect of exercise and KT application on disability with ODI. Consistent with our results, there are many studies in the literature showing a reduction in disability after only exercise or KT interventions in SIJD.[6,26,27] In the study conducted by Lee et al.,[28] in which the posterior pelvic tilt taping method was used in SIJD, it was reported that anterior pelvic tilt decreased and KT likely had a mechanical corrective effect. In a recent study in which the ligament correction KT technique was applied, it was shown that pelvic asymmetry decreased with KT.[29] Reduced disability with these treatments may be associated with reduced pain and restoration of pelvic symmetry.

Different KT techniques are applied in the treatment of SIJD. The techniques encountered in the literature are ligament correction,[24,29] posterior pelvic tilt taping,[28,30] and Manisha's KT protocol.[31] In this study, ligament correction and lymphatic correction techniques were investigated. In the literature, lymphatic correction is the most commonly used technique in the treatment of lymphedema and in the relief of pain and edema in the postoperative period.[32,33] There are also studies showing that this technique is effective in pain, tightness, and heaviness in patients with lymphedema.[34,35] The main purpose of the lymphatic correction technique is to reduce the pressure on the lymphatic vessels in the tissue, pulling the skin upward, and widening the space between the dermis and fascia. This improves lymphatic flow, reduces edema, and relieves pain by reducing pressure on subcutaneous pain receptors. It is also stated that the lymphatic correction technique provides normalization of muscle and fascial tone and is effective in the body's self-healing process.[34,36] The lymphatic correction technique has not previously been investigated in SIJD. Our study is the first study to use the lymphatic correction technique in this context.

The structures that support and limit the movement of the sacroiliac joint and help transmit shear forces are the ligaments and pelvic floor muscles. The muscles around the joint are the erector spinae, psoas, quadratus lumborum, piriformis, abdominal obliques, gluteals, and hamstrings. These muscles do not actively move the joint but act on the hip or lumbar spine. Causes of SIJD include capsular and ligamentous tension, hypomobility or hypermobility, compression and shear forces, soft tissue injuries, and myofascial pain.[37] In our study, both the lymphatic correction technique and the ligament correction technique were found to be effective in reducing pain and disability in patients with SIJD and in improving patient satisfaction. We believe that the lymphatic correction technique may be effective in healing ligamentous and soft tissue injuries by widening the space between the dermis and fascia, increasing blood and lymphatic circulation, and reducing the tension in the capsule and muscles.

A new method is currently being investigated. This new technique, called epidermis, dermis, and fascia (EDF) KT, has also been reported to have a healing effect on the fascia. The EDF technique is believed to be more effective than the lymphatic correction technique in improving the surrounding blood and interstitial fluid circulation. Therefore, considering the favorable effect of the circulatory technique in patients with SIJD in our study, we believe that the efficacy of the EDF technique should be investigated in this patient group.[38] In the future, the effectiveness of the EDF technique in SIJD can be investigated to determine whether it is more effective than other KT techniques.

There are many studies in the literature on the effectiveness of exercise in SIJD.[26] In a study investigating the effectiveness of exercise therapy in SIJD, it was reported that a rehabilitation program that includes exercises specific to the sacroiliac joint and lumbar region may not only reduce pain but also strengthen the gluteus maximus and latissimus dorsi, mobilize the sacroiliac joint, and contribute to stabilization of the muscles in this region.[6] In

our study, home exercise alone reduced pain during movement and disability; however, it had no effect on pain at rest. The duration and intensity of the exercise program may explain this result. Studies with longer exercise duration, frequency, and intensity may be warranted.

This study had some limitations. There was no sham KT group in our study. Therefore, the placebo effect of KT application should not be ignored. However, we would like to point out that the sham group methodology in KT application also presents some challenges. Another limitation was that two patients in the home exercise group had bilateral sacroiliac joint involvement, while there were no patients with bilateral involvement in the other groups. The pain and disability levels of these patients were not different from the other patients; nonetheless, this may have negatively affected the results in the home exercise group. This study also had notable strengths. First, the number of patients was determined by a power analysis, including a sufficiently large number of patients to obtain statistically significant results. Second, the study was conducted at two different centers, which allowed for a greater degree of external validity. Third, our study was designed prospectively, which helped ensure that the research was conducted in a rigorous manner. Finally, KT was performed by experienced physicians, which ensured the highest standard of care.

In conclusion, in the treatment of SIJD, both KT techniques added to the home exercise program were more effective on pain, patient global assessment, and disability than the home exercise program alone. Therefore, the addition of KT to a home exercise program is more beneficial for a more successful treatment.

Data Sharing Statement: The data that support the findings of this study are available from the corresponding author upon reasonable request.

Author Contributions: Concept, design, supervision, resources: B.S.T., D.E., S.A.; Materials: S.A., B.S.T., D.K., E.C.O.; Data collection and/or processing: B.S.T., S.A., D.K., E.C.O., D.G.; Analysis and/or interpretation: D.G., B.S.T., D.K.; Literature search: B.S.T., D.E., S.A., D.K.; Writing manuscript: B.S.T., D.K.; Critical review: B.S.T., D.K., D.G.

Conflict of Interest: The authors declared no conflicts of interest with respect to the authorship and/or publication of this article.

Funding: The authors received no financial support for the research and/or authorship of this article.

REFERENCES

1. Simopoulos TT, Manchikanti L, Singh V, Gupta S, Hameed H, Diwan S, et al. A systematic evaluation of prevalence and diagnostic accuracy of sacroiliac joint interventions. Pain Physician 2012;15:E305-44.
2. Slipman CW, Whyte WS 2nd, Chow DW, Chou L, Lenrow D, Ellen M. Sacroiliac joint syndrome. Pain Physician 2001;4:143-52.
3. Peebles R, Jonas CE. Sacroiliac joint dysfunction in the athlete: Diagnosis and management. Curr Sports Med Rep 2017;16:336-42. doi: 10.1249/JSR.0000000000000410.
4. Gartenberg A, Nessim A, Cho W. Sacroiliac joint dysfunction: Pathophysiology, diagnosis, and treatment. Eur Spine J 2021;30:2936-43. doi: 10.1007/s00586-021-06927-9.
5. von Heymann W, Moll H, Rauch G. Study on sacroiliac joint diagnostics. Manuelle Medizin 2018;56:239-48.
6. Javadov A, Ketenci A, Aksoy C. The efficiency of manual therapy and sacroiliac and lumbar exercises in patients with sacroiliac joint dysfunction syndrome. Pain Physician 2021;24:223-33.
7. Prather H. Sacroiliac joint pain: Practical management. Clin J Sport Med 2003;13:252-5. doi: 10.1097/00042752-200307000-00010.
8. Nejati P, Safarcherati A, Karimi F. Effectiveness of exercise therapy and manipulation on sacroiliac joint dysfunction: A randomized controlled trial. Pain Physician 2019;22:53-61.
9. Newman DP, Soto AT. Sacroiliac joint dysfunction: Diagnosis and treatment. Am Fam Physician 2022;105:239-45.
10. Sabrina S, Farooqui S, Khan MA, Khan AA, Khan FA. Effectiveness of evidence based physical therapy management approaches in sacroiliac joint dysfunction: A meta-analysis. J Coll Physicians Surg Pak 2023;33:572-7. doi: 10.29271/jcpsp.2023.05.572.
11. Khobragade S, Naqvi W, Dhankar S, Jungade S. Impact of K-Taping on sacroiliac joint pain in women after full-term normal delivery. JDMIMSUJournal of Datta Meghe Institute of Medical Sciences University 2019;14:352.
12. Gramatikova M, Nikolova E, Mitova S. Nature, application and effect of kinesio taping. APES 2014:4;115-9.
13. Çeliker R, Güven Z, Aydoğ T, Bağış S, Atalay A, Yağcı HÇ, et al. Kinezyolojik bantlama tekniği ve uygulama alanları. Türk Fiz Tıp Rehab Derg 2011;57:225-35. doi: 10.4274/tftr.46548
14. Lipinska A, Sliwinski Z, Kiebzak W, Senderek T, Kirenko J. Influence of kinesiotaping application on lymphoedema of an upper limb in women after mastectomy. Polish Journal of Physiotherapy Pol J Physiother 2007:7;258-69.
15. Hansen HC, Helm S 2nd. Sacroiliac joint pain and dysfunction. Pain Physician 2003;6:179-89.
16. Boyle K. Conservative management for patients with sacroiliac joint dysfunction [Internet]. In: Low back pain. InTech; 2012.
17. Kase K, Wallis J, Kase T. Clinical Therapeutic Applications of the Kinesio Taping® Method. 2nd ed. Dallas: Kinesio Taping Association; 2003.
18. Ay S. Sakroiliak eklem disfonksiyonunda kinezyolojik bantlama. In: Geler Külcü D. Vural M, editörler. Fiziyatrist bakış açısıyla kinezyolojik bantlama. 1. Baskı. Hipokrat Yayınevi; 2023. s. 65-79.

19. Evcik D, Ketenci A, Sonel Tur B. Bel ağrılarında bantlama. In: Borman P. Zinnuroğlu M, editörler. Kas iskelet sistemi sorunlarında kinezyobantlama. 1. Baskı. Ankara: Türkiye Klinikleri; 2017. s. 149-58.
20. Kase K, Wallis J, Kase T. Section 4 Trunk and Back. Sacroiliac sprain and inflammation. Clinical therapeutic applications of the Kinesio taping method. Tokyo: Ken İkai; 2003. p. 88.
21. Copay AG, Cher DJ. Is the Oswestry Disability Index a valid measure of response to sacroiliac joint treatment? Qual Life Res 2016;25:283-92. doi: 10.1007/s11136-015-1095-3.
22. Yakut E, Düger T, Oksüz C, Yörükan S, Ureten K, Turan D, et al. Validation of the Turkish version of the Oswestry Disability Index for patients with low back pain. Spine (Phila Pa 1976) 2004;29:581-5. doi: 10.1097/01.brs.0000113869.13209.03.
23. Buchanan P, Vodapally S, Lee DW, Hagedorn JM, Bovinet C, Strand N, et al. Successful diagnosis of sacroiliac joint dysfunction. J Pain Res 2021;14:3135-43. doi: 10.2147/JPR.S327351.
24. Ordahan B, Eriç Horasanlı J. Effectiveness of kinesiotaping in pregnant women with sacroiliac joint pain: A randomised controlled study. Int J Clin Pract 2021;75:e14432. doi: 10.1111/ijcp.14432.
25. Kroopf LR, Philip K, Dang MN, Shipon S. Disability associated with sacroiliac joint diseases. In: Abd-Elsayed A, Sayed D, editors. Sacroiliac Joint Pain. Oxford: Oxford University Press; 2021. p. 41-50.
26. Al-Subahi M, Alayat M, Alshehri MA, Helal O, Alhasan H, Alalawi A, et al. The effectiveness of physiotherapy interventions for sacroiliac joint dysfunction: A systematic review. J Phys Ther Sci 2017;29:1689-94. doi: 10.1589/jpts.29.1689.
27. Boyle KL. Managing a female patient with left low back pain and sacroiliac joint pain with therapeutic exercise: A case report. Physiother Can 2011;63:154-63.
28. Lee JH, Yoo WG, Kim MH, Oh JS, Lee KS, Han JT. Effect of posterior pelvic tilt taping in women with sacroiliac joint pain during active straight leg raising who habitually wore high-heeled shoes: A preliminary study. J Manipulative Physiol Ther 2014;37:260-8. doi: 10.1016/j.jmpt.2014.01.005.
29. Sabrina SIF, Khan MA, Khan AA, Hameed A, Khan FA. The effectiveness of kinesio-taping and muscle energy technique among postpartum females with sacro-iliac joint dysfunction. Med Forum 2022;33:96-9.
30. Lee JH, Yoo WG. Application of posterior pelvic tilt taping for the treatment of chronic low back pain with sacroiliac joint dysfunction and increased sacral horizontal angle. Phys Ther Sport 2012;13:279-85. doi: 10.1016/j.ptsp.2011.10.003.
31. Sarkar M, Goyal M, Samuel AJ. Comparing the effectiveness of the muscle energy technique and kinesiotaping in mechanical sacroiliac joint dysfunction: A non-blinded, two-group, pretest-posttest randomized clinical trial protocol. Asian Spine J 2021;15:54-63. doi: 10.31616/asj.2019.0300.
32. Donec V, Kriščiūnas A. The effectiveness of Kinesio Taping® after total knee replacement in early postoperative rehabilitation period. A randomized controlled trial. Eur J Phys Rehabil Med 2014;50:363-71.
33. Białoszewski D, Woźniak W, Zarek S. Clinical efficacy of kinesiology taping in reducing edema of the lower limbs in patients treated with the ilizarov method--preliminary report. Ortop Traumatol Rehabil 2009;11:46-54.
34. Ozsoy-Unubol T, Sanal-Toprak C, Bahar-Ozdemir Y, Akyuz G. Efficacy of kinesio taping in early stage breast cancer associated lymphedema: A randomized single blinded study. Lymphology 2019;52:166-76.
35. Pajero Otero V, García Delgado E, Martín Cortijo C, Romay Barrero HM, de Carlos Iriarte E, Avendaño-Coy J. Kinesio taping versus compression garments for treating breast cancer-related lymphedema: A randomized, cross-over, controlled trial. Clin Rehabil 2019;33:1887-97. doi: 10.1177/0269215519874107.
36. Sobiech M, Czępińska A, Zieliński G, Zawadka M, Gawda P. Does application of lymphatic drainage with kinesiology taping have any effect on the extent of edema and range of motion in early postoperative recovery following primary endoprosthetics of the knee joint? J Clin Med 2022;11:3456. doi: 10.3390/jcm11123456.
37. Kiapour A, Joukar A, Elgafy H, Erbulut DU, Agarwal AK, Goel VK. Biomechanics of the sacroiliac joint: Anatomy, function, biomechanics, sexual dimorphism, and causes of pain. Int J Spine Surg 2020;14:3-13. doi: 10.14444/6077.
38. Nakao H, Hasegawa S, Tomimatsu M, Sasaki J, Yamamoto S, Watanabe S, et al. Three-dimensional imaging evaluation of facial swelling after orthognathic surgery with compression and Kinesio taping therapy: A randomized clinical trial. Ann Med Surg (Lond) 2024;86:1446-54. doi: 10.1097/MS9.0000000000001719.