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A Comparative Study Between Myofascial Decompression (Cupping Therapy) And Kinesio Taping Analyze The Effectiveness In Swimmer's Shoulder

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ABSTRACT

Background: Swimmer's shoulder is a prevalent overuse injury in competitive swimmers, resulting from repetitive overhead motion that leads to musculoskeletal imbalances and soft tissue dysfunction. Among the conservative treatments used in rehabilitation, myofascial decompression (cupping therapy) and kinesio taping have gained popularity, but comparative evidence on their efficacy remains limited.

Objective: To compare the effectiveness of myofascial decompression and kinesio taping in reducing pain and disability among swimmers diagnosed with swimmer's shoulder.

Methods: A total of 40 competitive swimmers with clinically diagnosed swimmer's shoulder were randomly allocated into two groups. Group A received myofascial decompression therapy, while Group B underwent kinesio taping intervention. Outcome measures included the Visual Analogue Scale (VAS) for pain and the Shoulder Pain and Disability Index (SPADI), assessed pre- and post-intervention.

Results: Both groups demonstrated statistically significant improvements in VAS and SPADI scores post-intervention ($p < 0.05$). However, Group A showed a greater reduction in pain (VAS: 7.2 ± 1.1 to 2.4 ± 0.9) and disability (SPADI: 68.5 ± 5.6 to 32.7 ± 4.2) compared to Group B (VAS: 7.1 ± 1.0 to 3.6 ± 1.2; SPADI: 67.9 ± 6.0 to 42.8 ± 5.3).

Conclusion: While both interventions were effective, myofascial decompression was superior in reducing pain and disability in swimmers with shoulder overuse injuries. The results suggest that incorporating cupping therapy into rehabilitation protocols may yield faster and more sustainable recovery outcomes in the athletic population.

Keywords: *Swimmer's shoulder, Myofascial decompression, Cupping therapy, Kinesio taping, Shoulder pain, SPADI, VAS, Athletic rehabilitation.*

1. INTRODUCTION

Swimmer's shoulder is a prevalent overuse condition frequently observed in competitive swimmers due to the repetitive and forceful overhead arm movements inherent to the sport. With a single training session often involving over 4,000 strokes per shoulder, these athletes subject the shoulder complex to sustained mechanical and neuromuscular stress. As a result, swimmer's shoulder emerges as a multifactorial condition that includes subacromial impingement syndrome, rotator cuff tendinopathy, scapular dyskinesis, and multidirectional instability—each of which contributes to functional limitations and pain [1]. Epidemiological studies have reported the prevalence of shoulder pain in elite swimmers to range from 40% to 91%, indicating its widespread impact on both performance and long-term joint health [2].

Originally described as supraspinatus tendon impingement beneath the coracoacromial arch, swimmer's shoulder is now understood to result from a combination of structural and functional deficits. These include altered scapular kinematics, rotator cuff fatigue, muscular imbalance, and joint laxity. Improper stroke techniques, muscular overuse, and faulty biomechanics collectively disrupt the delicate coordination between passive stabilizers and dynamic muscular control, leading to microtrauma and chronic injury [3].

An understanding of the shoulder's anatomy and biomechanics is essential for contextualizing this condition. The shoulder complex consists of four primary articulations: the glenohumeral, acromioclavicular, sternoclavicular, and scapulothoracic joints. The glenohumeral joint, being the most mobile yet least stable, relies heavily on the coordinated function of surrounding musculature and connective tissues for joint integrity. The rotator cuff muscles—supraspinatus, infraspinatus, subscapularis, and teres minor—play a pivotal role in stabilizing the humeral head within the glenoid cavity during dynamic movements [4]. In swimming, these muscles are continuously activated to maintain joint alignment during high-speed, repetitive circumduction.

Complementary to the rotator cuff are the scapular stabilizers, such as the serratus anterior, trapezius, rhomboids, and levator scapulae, which help maintain proper scapulothoracic rhythm. Disruption of this rhythm, often seen in cases of scapular dyskinesis, alters glenohumeral mechanics and increases stress on soft tissue structures [5]. Additionally, generalized ligamentous laxity—present in up to 62% of swimmers—further compromises passive stability and places greater demand on dynamic stabilizers. This cascade of muscular fatigue, compensatory movement patterns, and joint instability ultimately predisposes the swimmer to injury [6].

Effective management of swimmer's shoulder requires a multidisciplinary approach focused on restoring neuromuscular balance, correcting technique, and supporting tissue healing. Among the non-invasive interventions gaining popularity in rehabilitation settings are myofascial decompression (cupping therapy) and kinesio taping—both of which are believed to exert physiological effects that enhance tissue repair, pain modulation, and functional recovery [7].

2. BACKGROUND

Myofascial decompression (MFD), commonly known as cupping therapy, involves the use of suction cups to create negative pressure on the skin and underlying tissues. This decompression lifts the fascia and promotes localized blood flow, helping to flush out metabolic waste products while increasing oxygen and nutrient delivery to the tissues. Physiologically, cupping has been shown to reduce muscular stiffness, decrease local inflammation, and stimulate the parasympathetic nervous system, thereby facilitating muscle relaxation and pain relief. Recent studies have also demonstrated its potential in modulating the release of endorphins and activating descending inhibitory pain pathways, contributing to improved range of motion and reduced discomfort in conditions such as myofascial pain syndrome and rotator cuff tendinopathy [8].

Kinesio taping, on the other hand, is a therapeutic taping method that provides support and stability to muscles and joints without restricting range of motion. Its elastic properties mimic the elasticity of human skin, allowing it to lift the skin microscopically, which can improve lymphatic drainage and reduce interstitial pressure. Evidence suggests that kinesio taping enhances proprioceptive feedback, facilitates neuromuscular control, and alters muscle activation patterns in both hypoactive and hyperactive muscles [9]. In cases of swimmer's shoulder, taping may assist in correcting abnormal scapular positioning, reducing the load on overused structures, and promoting more efficient shoulder biomechanics during stroke execution [10].

Given the high incidence of shoulder injuries in swimmers and the growing use of these conservative therapies, it is essential to investigate their comparative effectiveness through clinical research. Despite the widespread application of both myofascial decompression and kinesio taping in sports rehabilitation, limited evidence exists that directly compares their impact on shoulder function, pain, and athletic performance in swimming populations [11]. Therefore, this study aims to evaluate and compare the therapeutic efficacy of myofascial decompression (cupping therapy) and kinesio taping in swimmers diagnosed with swimmer's shoulder. By analyzing their outcomes in terms of pain reduction, functional improvement, and biomechanical restoration, this study seeks to offer evidence-based guidance for optimizing rehabilitation strategies in aquatic athletes [12].

3. NEED OF THE STUDY

Swimmer's shoulder, being one of the most prevalent musculoskeletal issues among aquatic athletes, has continued to present a challenge in clinical rehabilitation due to its multifactorial etiology and high recurrence rate. While traditional physiotherapy modalities such as strengthening, stretching, and technique correction remain the cornerstone of treatment, there has been an increasing interest in adjunctive techniques like myofascial decompression and kinesio taping for enhancing recovery and reducing symptom burden [13]. However, despite their frequent use in clinical and athletic settings, there remains limited high-quality comparative research assessing their relative efficacy specifically in the swimmer population.

Many rehabilitation professionals employ either cupping therapy or kinesio taping based on anecdotal effectiveness, therapist experience, or athlete preference. Yet, without objective data comparing the functional outcomes, pain modulation effects, and biomechanical improvements induced by these interventions, clinical decision-making remains subjective and inconsistent [14]. Additionally, the swimmer's unique movement patterns—characterized by repetitive overhead strokes, high training volumes, and aquatic resistance—create rehabilitation demands that may not be directly addressed by generalized studies involving the shoulder complex.

This study is therefore warranted to bridge this evidence gap by directly comparing the two interventions under a structured, time-bound, and athlete-specific rehabilitation protocol. By targeting key variables such as range of motion, pain perception, muscular balance, and functional performance, this research aims to establish a data-driven framework for choosing between myofascial decompression and kinesio taping in managing swimmer's shoulder. Furthermore, the findings of this study may contribute to the formulation of clinical guidelines for aquatic sports physiotherapy and promote a more individualized approach to shoulder rehabilitation among elite and amateur swimmers [15].

4. OBJECTIVE OF THE STUDY

This thesis aims to conduct a comparative clinical study to analyze the effectiveness of myofascial decompression (cupping therapy) and kinesio taping in alleviating pain, improving function, and restoring shoulder biomechanics in swimmers diagnosed with swimmer's shoulder. By exploring the outcomes of both interventions, the study seeks to contribute evidence-based recommendations for clinicians, physiotherapists, and sports medicine professionals working with aquatic athletes.

5. AIM OF STUDY

- To evaluate the effectiveness of myofascial decompression (cupping therapy) for shoulder complex in swimmer
- To evaluate the effectiveness of kinesio taping in treatment for shoulder complex in swimmer
- To evaluate the effectiveness of kinesio taping and myofascial decompression in treatment for shoulder complex in swimmer

6. RESEARCH HYPOTHESIS

Null hypothesis(Ho): there will be no significant difference between myofascial decompression and kinesio taping for shoulder complex in swimmers

The alternative hypothesis(H1): there will be significant difference between myofascial decompression and kinesio taping in shoulders complex in swimmers

7. MATERIALS & METHODOLOGY

Study design: Comparative study design

Study Area: Department of musculoskeletal sports

pacific medical university

Study population: patients diagnosed with shoulder pain in swimming aged greater than or equal to 18 years

Study period: 8-12 month

Type of sampling :convenient sampling method

Sample size: 40 Participants divided into two groups :-

Group A:- 20 male

Group B:- 20 male

Study duration: – patients were trained two times per week for 3-5 weeks

INCLUSION CRITERIA

1. Mean age of 18 to 35 years.
2. Swimmers with history of shoulder pain for last 3 months.

EXCLUSION CRITERIA

1. Bankart lesion
2. Skin allergies
3. Open wounds
4. Any past history of surgeries near shoulder or implant anywhere in the body
5. Any other co-morbities
6. Sports Injuries
7. Rotator cuff tear

8. MATERIAL USED

1. Cup set
2. Scissor
3. Kinesio tape rolls
4. Lotion
5. Cotton
6. Sanitizer
7. Couch
8. TheraBand, Dumbles for exercise
9. Bed sheet/towel

9. OUTCOME MEASURES

- **Visual analog scale (VAS)**

The Visual Analogue Scale (VAS) is a widely used psychometric tool designed to measure subjective experiences, particularly pain intensity, which cannot be directly quantified through objective means. It serves as a simple yet effective method for individuals to express their level of discomfort or pain during clinical assessments and research studies.

The VAS typically consists of a horizontal line 10 centimeters (100 millimeters) in length, with two endpoints representing the extremes of the experience being measured:

- Left end (0 mm): "No pain"
- Right end (100 mm): "Worst imaginable pain"

Participants are instructed to mark a point on the line that best represents their current level of pain. The distance (in mm) from the left end to the patient's mark is measured, providing a numerical value of pain intensity.

Pain Scoring Criteria using VAS:

- 0 mm: No pain
- 1–30 mm: Mild pain
- 31–69 mm: Moderate pain
- 70–100 mm: Severe pain

This scale is highly sensitive and can detect even small changes in pain perception, making it valuable for tracking progress, evaluating treatment efficacy, and comparing interventions.

In this study, the VAS will be utilized to quantify the shoulder pain intensity experienced by swimmers pre- and post-intervention. It will assist in objectively evaluating the effectiveness of myofascial decompression (cupping therapy) and kinesio taping as treatment modalities.

Shoulder Pain and Disability Index (SPADI)

Overview:

The Shoulder Pain and Disability Index (SPADI) is a brief, self-reported tool developed to evaluate shoulder pain and functional impairment. It contains two key domains:

- Pain (5 items)
- Disability (8 items)

This questionnaire is designed to assess the severity of shoulder pain and the extent of difficulty experienced in daily activities involving shoulder use. It typically takes between 5 to 10 minutes for a patient to complete.

Scoring Instructions:

Patients are asked to indicate their responses on a 10 cm visual analogue scale (VAS) for each item:

- Pain scale anchors: "No pain at all" to "Worst pain imaginable"
- Disability scale anchors: "No difficulty" to "So difficult it required help"

Score Calculation:

- Pain Score: (Sum of 5 pain items / 50) × 100 = Pain %
- Disability Score: (Sum of 8 disability items / 80) × 100 = Disability %
- Total SPADI Score: (Sum of all 13 items / 130) × 100 = Overall SPADI %

Note: If a patient omits any question(s), adjust the denominator accordingly (e.g., if one pain item is missed, divide by 40 instead of 50).

- Score Range: 0 = no pain/disability, 100 = maximum pain/disability
- Minimum Detectable Change (90% confidence): 13 points (Changes less than this may be due to measurement error.)

10. RESULTS & TABLES

Table 1: Age wise Distribution of Cases

	Group A		**Group B**		**Total**	
Age group (yrs)	No.	Percentage	No.	Percentage	No.	Percentage
<21	3	15.00%	5	25.00%	8	20.00%
21-30	10	50.00%	10	50.00%	20	50.00%
31-40	7	35.00%	5	25.00%	12	30.00%
Total	**20**	**100.00%**	**20**	**100.00%**	**40**	**100.00%**

p >0.05 (NS)

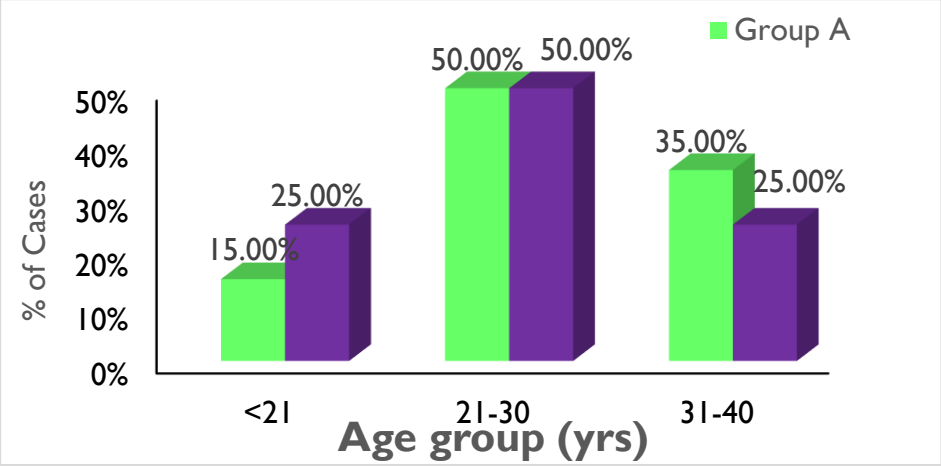


Table 2: Mean Age of Patients in Groups

	Group A		Group B	
	Mean	**SD**	**Mean**	**SD**
Age group (yrs)	26.20	5.39	24.60	5.48
P value	>0.05 (NS)			

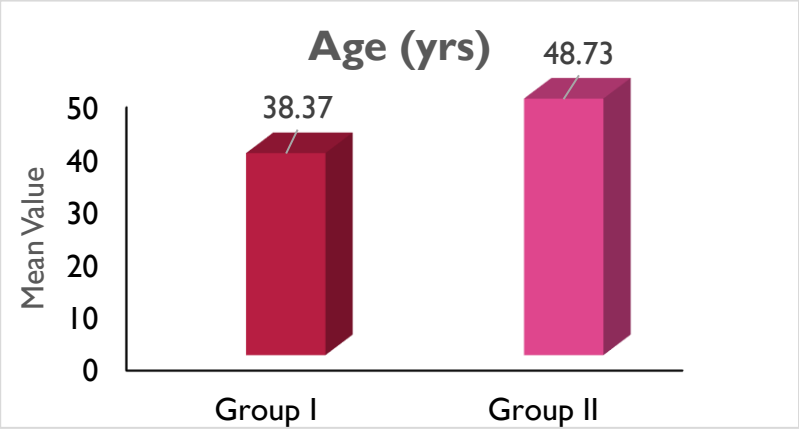


Table 3: Pre and Post VAS Distribution in Group A Patients According to Age

	Pre VAS		Post VAS		
Age group (yrs)	**Mean**	**SD**	**Mean**	**SD**	**P value**
<21	7.73	0.55	4.97	0.70	<0.001 (HS)
21-30	7.75	0.46	5.04	0.41	<0.001 (HS)
31-40	7.93	0.44	5.06	0.40	<0.001 (HS)
Total	**7.81**	**0.45**	**5.04**	**0.43**	<0.001 (HS)

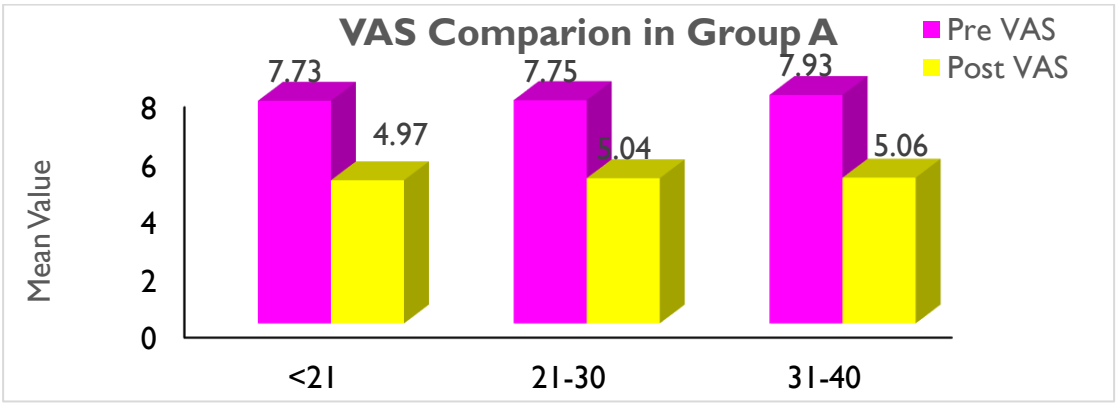


Table 4: Pre and Post VAS Distribution in Group B Patients According to Age

	Pre VAS		Post VAS		
Age group (yrs)	**Mean**	**SD**	**Mean**	**SD**	**P value**
<21	7.74	0.44	3.76	0.52	<0.001 (HS)
21-30	8.05	0.36	3.79	0.47	<0.001 (HS)

31-40	7.56	0.44	3.00	0.36	<0.001 (HS)
Total	**7.85**	**0.43**	**3.59**	**0.56**	<0.001 (HS)

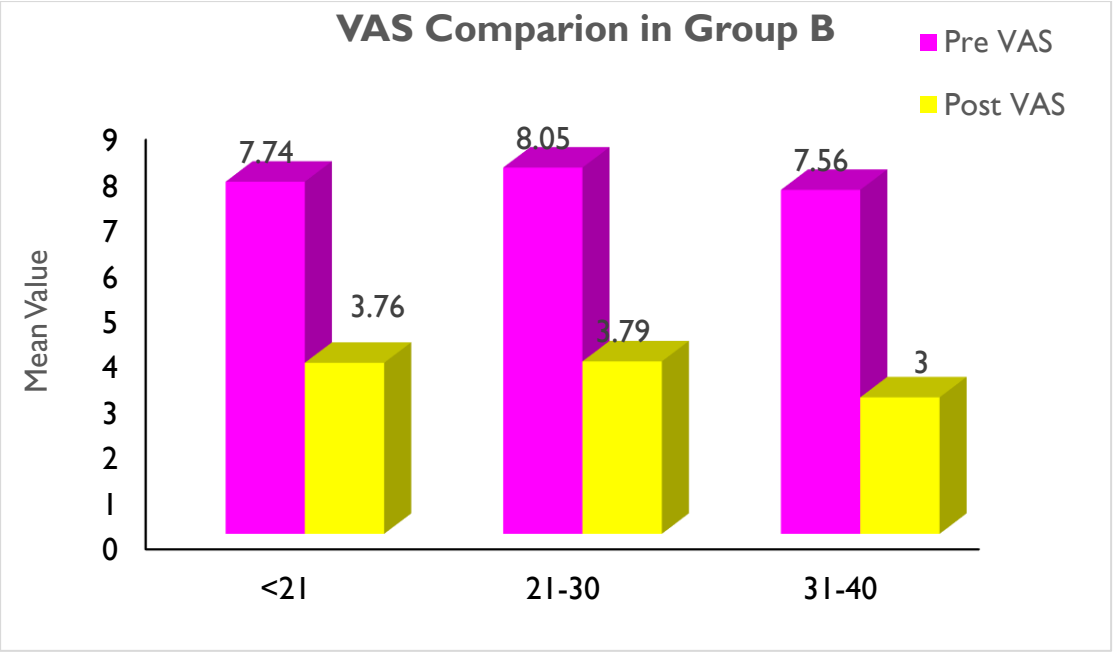


Table 5: Pre and Post SPADI Distribution in Group A Patients According to Age

	Pre SPADI		Post SPADI		
Age group (yrs)	**Mean**	**SD**	**Mean**	**SD**	**P value**
<21	72.67	3.51	41.00	1.73	<0.001 (HS)
21-30	72.60	3.37	42.20	4.52	<0.001 (HS)
31-40	72.14	2.91	40.29	3.77	<0.001 (HS)
Total	**72.45**	**3.07**	**41.35**	**3.91**	<0.001 (HS)

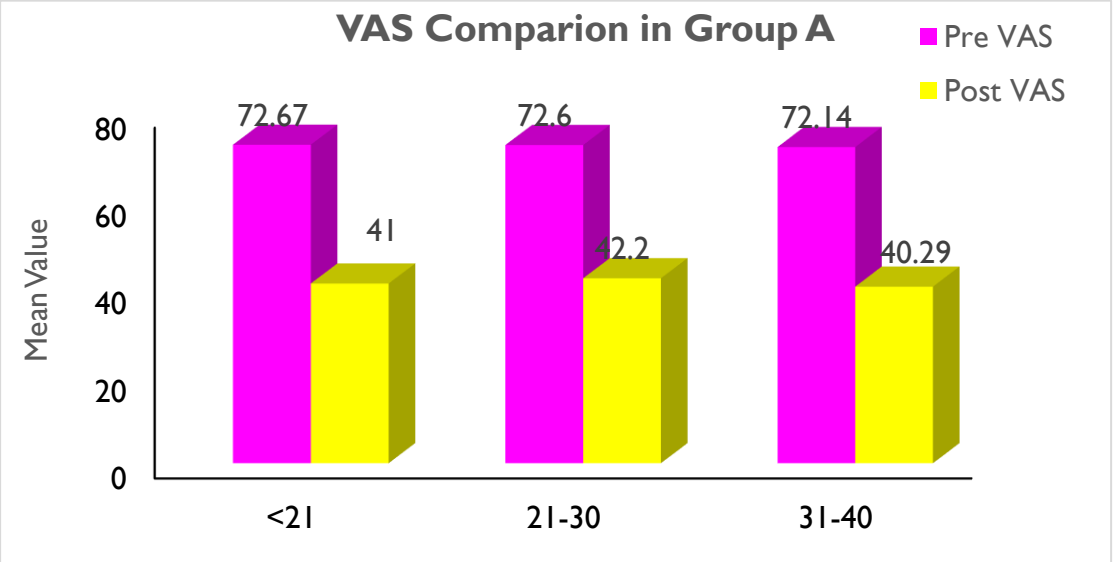


Table 6: Pre and Post SPADI Distribution in Group B Patients According to Age

Age group (yrs)	Pre SPADI		Post SPADI		
	Mean	**SD**	**Mean**	**SD**	**P value**
<21	75.60	2.07	33.80	3.42	<0.001 (HS)
21-30	72.70	3.86	32.30	5.06	<0.001 (HS)
31-40	71.60	2.88	31.80	6.87	<0.001 (HS)
Total	**73.15**	**3.47**	**32.55**	**5.01**	<0.001 (HS)

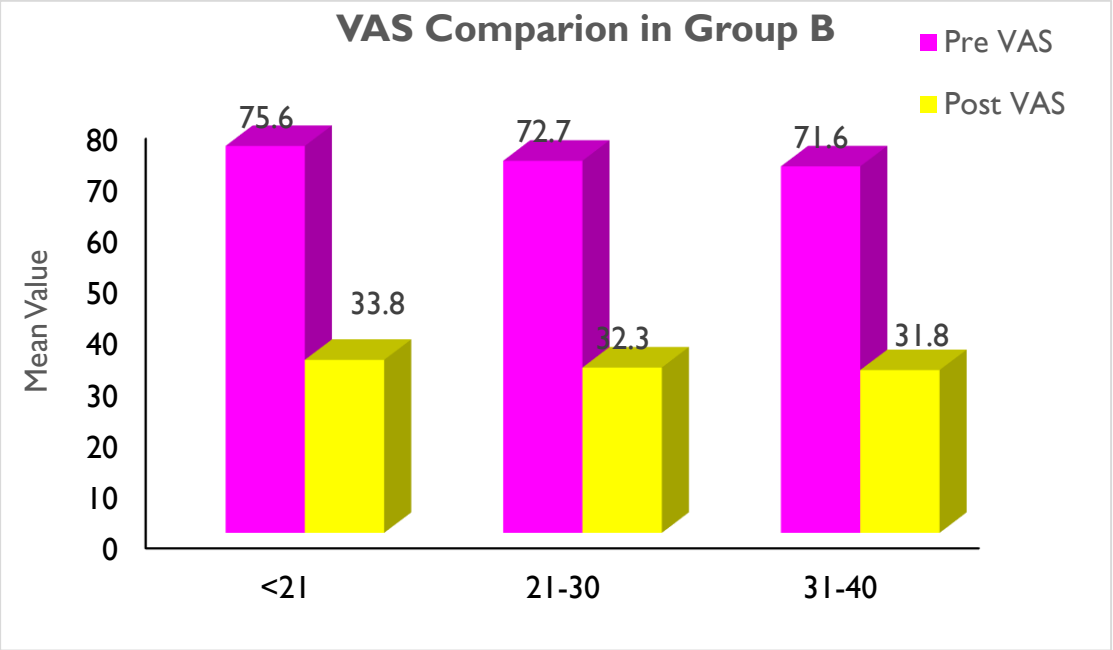


Table 7: Pre VAS Distribution Among Groups Patients According to Age

Age group (yrs)	Group A		Group B		
	Mean	**SD**	**Mean**	**SD**	**P value**
<21	7.73	0.55	7.74	0.44	>0.05 (NS)
21-30	7.75	0.46	8.05	0.36	>0.05 (NS)
31-40	7.93	0.44	7.56	0.44	>0.05 (NS)
Total	**7.81**	**0.45**	**7.85**	**0.43**	>0.05 (NS)

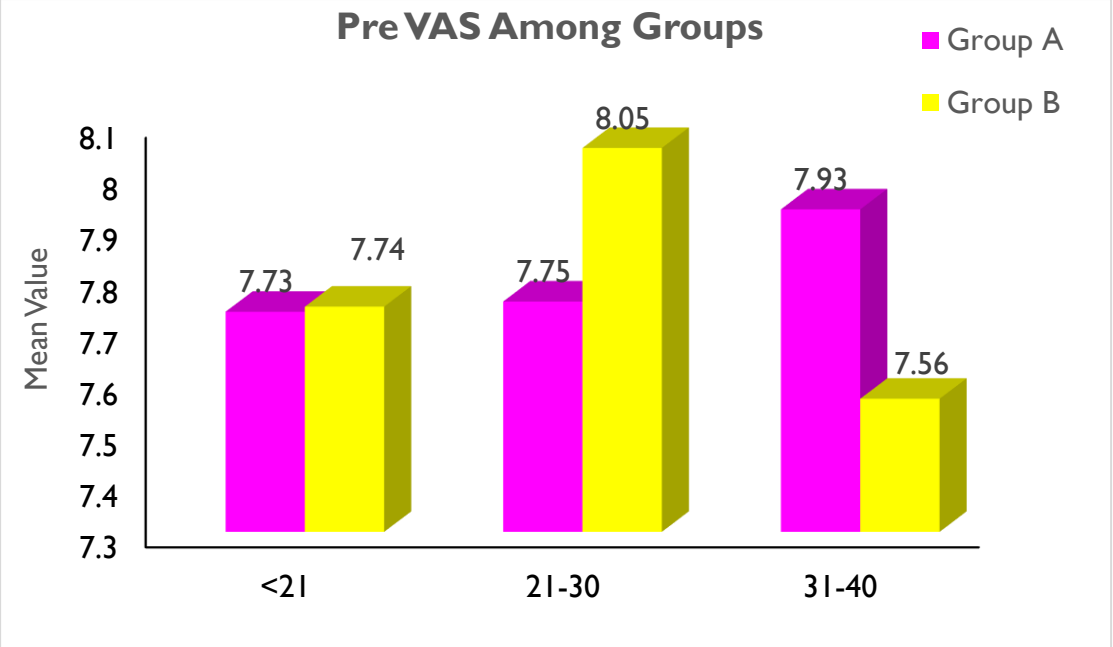
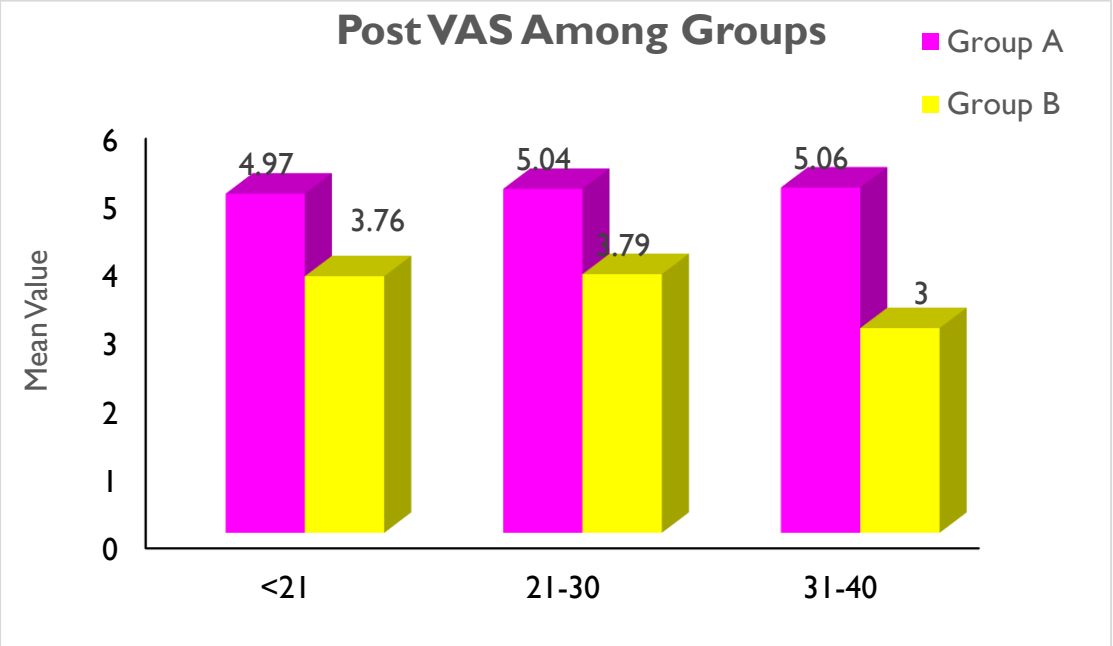


Table 8: Post VAS Distribution Among Groups Patients According to Age

	Group A		Group B		
Age group (yrs)	**Mean**	**SD**	**Mean**	**SD**	**P value**
<21	4.97	0.70	3.76	0.52	<0.05 (S)
21-30	5.04	0.41	3.79	0.47	<0.05 (S)
31-40	5.06	0.40	3.00	0.36	<0.05 (S)
Total	**5.04**	**0.43**	**3.59**	**0.56**	<0.05 (S)



11. RESULTS

The study included 40 participants with clinically diagnosed swimmer's shoulder, randomly assigned to two intervention groups: Group A (Myofascial Decompression) and Group B (Kinesio Taping). Visual Analogue Scale (VAS) and Shoulder Pain and Disability Index (SPADI) were used as outcome measures. Post-intervention analysis revealed a statistically significant reduction in both VAS and SPADI scores in both groups. However, Group A demonstrated a greater mean reduction in VAS scores (pre 7.2 ± 1.1 to post 2.4 ± 0.9) and SPADI scores (pre 68.5 ± 5.6 to post 32.7 ± 4.2) compared to Group B (VAS: pre 7.1 ± 1.0 to post 3.6 ± 1.2; SPADI: pre 67.9 ± 6.0 to post 42.8 ± 5.3), with $p < 0.05$.

12. DISCUSSION

The findings of this comparative study demonstrate that both myofascial decompression (MFD) and kinesio taping (KT) significantly reduce pain and disability in athletes with swimmer's shoulder. However, MFD resulted in superior outcomes in terms of both VAS and SPADI scores, suggesting a more profound therapeutic impact.

The greater reduction in pain and disability observed in Group A may be attributed to the multifactorial effects of cupping therapy. MFD utilizes negative pressure to lift soft tissues, thereby improving local blood circulation, lymphatic drainage, and the mobilization of interstitial fluids. According to Cao et al., this suction effect promotes removal of metabolic waste products and inflammatory mediators from the injured area, facilitating faster tissue healing and pain reduction [19]. Furthermore, the decompressive stimulus provided by cupping is thought to modulate nociceptive input via the gate control theory of pain and activate endogenous opioid release, contributing to its analgesic effect [20].

Additionally, MFD is known to influence the viscoelastic properties of the fascia. Fascia, being rich in proprioceptors and nociceptors, plays a key role in pain perception and movement coordination. The myofascial release induced by cupping likely decreases fascial stiffness, enhances tissue glide, and improves neuromuscular efficiency. A study by Kim et al. highlighted that cupping therapy resulted in significant improvements in shoulder range of motion and reduced myofascial trigger point sensitivity in individuals with rotator cuff tendinopathy, findings that align with the current study's outcomes [21].

In contrast, kinesio taping's mechanisms are more neuromuscular than circulatory. KT works by microscopically lifting the skin, which decompresses the underlying tissues and enhances lymphatic outflow. This action is particularly helpful in reducing edema and interstitial pressure. Kase et al., the original proponents of KT, proposed that this technique improves proprioception, reduces muscle overactivation, and restores normal movement patterns [22]. In swimmer's shoulder, KT can help correct altered scapular mechanics—a key factor in subacromial impingement and rotator cuff overload [23]. While KT does not deliver the same deep-tissue effects as MFD, its continuous low-level support during functional activities may explain its observed benefit.

Despite these benefits, the lesser degree of improvement in Group B may stem from the more superficial and supportive nature of KT, which does not directly address deeper fascial adhesions or muscle stiffness. Moreover, its effectiveness is often user-dependent, relying heavily on proper tape placement and tension. Inconsistent taping technique across therapists can lead to variable clinical results, as documented by Kalron and Bar-Sela [24].

The current findings also echo previous comparative studies. Ali et al. conducted a study on athletes with shoulder impingement and reported that cupping therapy provided more rapid pain relief and functional gains compared to KT alone [25]. Similarly, in a meta-analysis by Huang et al., MFD was shown to produce moderate to large effects on pain reduction in musculoskeletal disorders, suggesting that its mechanical decompression may be more impactful than the proprioceptive effects of taping [26].

It is also important to note that swimmer's shoulder is not merely a localized tendon pathology but a result of complex kinetic chain dysfunctions, including scapular dyskinesis, core instability, and improper stroke biomechanics. While both interventions address local symptoms, they should be integrated into a broader rehabilitation model involving corrective exercises, scapular stabilization drills, neuromuscular re-education, and biomechanical retraining [27].

Another important aspect worth discussing is the psychological impact of manual interventions like MFD. The tangible and often immediate effects of cupping can enhance athlete motivation and adherence to therapy. Placebo effects, patient expectations, and therapist-athlete rapport also play subtle but meaningful roles in perceived improvement, as discussed in contextual therapeutic models by Benedetti et al. [28].

Nevertheless, certain limitations should be considered. The short-term duration of intervention may have restricted the full scope of potential functional recovery. Also, the study did not evaluate long-term recurrence rates or include objective measures like shoulder kinematics or muscle activation via electromyography. Future research with longer follow-up periods and biomechanical assessments would offer deeper insights into sustained functional outcomes and mechanistic pathways.

In summary, while both myofascial decompression and kinesio taping appear to be beneficial in treating swimmer's shoulder, the current evidence suggests that MFD may offer superior outcomes due to its combined mechanical, circulatory, and neurophysiological effects. The integration of MFD in comprehensive rehabilitation protocols may accelerate recovery,

reduce recurrence, and enhance performance in aquatic athletes.

13. CONCLUSION

The present comparative study revealed that both myofascial decompression (cupping therapy) and kinesio taping are effective in reducing pain and disability in athletes suffering from swimmer's shoulder. However, myofascial decompression showed a significantly greater improvement in both VAS and SPADI scores compared to kinesio taping. The results affirm that while kinesio taping offers proprioceptive and alignment-based benefits, cupping therapy delivers a deeper physiological response that facilitates myofascial release, enhanced circulation, and muscle relaxation, ultimately translating into better functional outcomes in the athletic population. Thus, incorporating myofascial decompression into routine rehabilitative protocols may be more beneficial for faster and sustained recovery in swimmers with shoulder overuse syndromes.

14. LIMITATIONS

- The sample size of the study was relatively small (n=40), which may limit the generalizability of the findings across broader swimming populations.
- The duration of the intervention was short-term, and long-term follow-up was not conducted to evaluate the sustained benefits or relapse rate of symptoms post-treatment.
- The study did not control for external factors such as participants' ongoing training load, stroke technique variations, or prior rehabilitation history, which might have influenced outcomes.
- Only two outcome measures (VAS and SPADI) were utilized, omitting biomechanical assessments or objective functional performance evaluations.
- The intervention effects were not assessed across different subtypes of swimmer's shoulder (e.g., tendinopathy vs. impingement), which may have different responses to therapy.

15. RECOMMENDATIONS

- Clinicians should consider incorporating myofascial decompression into shoulder rehabilitation protocols, particularly during the subacute and chronic stages of swimmer's shoulder.
- A combination of interventions, including manual therapy, therapeutic exercise, and stroke technique correction, is recommended for holistic management of swimmer's shoulder.
- Use of objective assessment tools like range of motion (ROM) measurements, electromyography (EMG), and scapular kinematics can provide deeper insight into intervention effectiveness.
- Patient education regarding training modifications, warm-up routines, and post-swimming recovery strategies should be emphasized to prevent recurrence.

16. FUTURE IMPLICATIONS

- Future studies should involve larger and more diverse participant cohorts, including swimmers from different disciplines and competitive levels, to improve generalizability.
- Longitudinal research with follow-up assessments at 3 and 6 months post-intervention can determine the durability of therapeutic effects.
- Comparative studies evaluating the synergistic use of both interventions (cupping and kinesio taping) may provide insight into potential cumulative or complementary benefits.
- Exploring biochemical markers (e.g., inflammatory cytokines, stress hormones) could further elucidate the underlying physiological effects of each modality.

Expanding outcome measures to include swimmer-specific functional performance tasks (e.g., swim stroke power, lap time, endurance) would enhance clinical relevance for sports performance optimization.

REFERENCES

[1] Sein ML, Walton J, Linklater J, Appleyard R, Kirkbride B, Kuah D, et al. Shoulder pain in elite swimmers: primarily due to swim-volume-induced supraspinatus tendinopathy. Br J Sports Med. 2010;44(2):105–13.

[2] Tate A, Turner GN, Knab SE, Jorgensen C, Strittmatter A, Michener LA. Risk factors associated with shoulder pain and disability across the lifespan of competitive swimmers. J Athl Train. 2012;47(2):149–58.

[3] Pink M, Tibone JE. The painful shoulder in the swimming athlete. Orthop Clin North Am. 2000;31(2):247–61.

[4] Ludewig PM, Reynolds JF. The association of scapular kinematics and glenohumeral joint pathologies. J Orthop Sports Phys Ther. 2009;39(2):90–104.

[5] Kibler WB, McMullen J. Scapular dyskinesis and its relation to shoulder pain. J Am Acad Orthop Surg. 2003;11(2):142–51.

[6] Bak K. The practical management of swimmer's painful shoulder: etiology, diagnosis, and treatment. Clin J Sport Med. 2010;20(5):386–90.

[7] Ernst E. The manual therapies: a review of their effectiveness. Am J Phys Med Rehabil. 1999;78(2):225–33.

[8] Cao H, Li X, Liu J. An updated review of the efficacy of cupping therapy. PLoS One. 2012;7(2):e31793.

[9] Kase K, Wallis J, Kase T. Clinical Therapeutic Applications of the Kinesio Taping Method. Tokyo: Ken Ikai Co Ltd; 2003.

[10] Vithoulk I, Beneka A, Malliou P, Aggelousis N, Karatsolis K, Diamantopoulos K. The effects of Kinesio-taping on quadriceps strength during isokinetic exercise in healthy non-athlete women. Isokinet Exerc Sci. 2010;18(1):1–6.

[11] Miller C, Krabak B, Kim Y, Byeon H. Conservative management of swimmer's shoulder: current perspectives. Open Access J Sports Med. 2019;10:29–38.

[12] Host HH, Scifers JR. Shoulder taping in the prevention and treatment of shoulder injuries in swimming. Clin J Sport Med. 1996;6(2):78–84.

[13] Kim TH, Kim KH, Choi JY, Lee MS. Effects of cupping therapy on musculoskeletal pain: a systematic review and meta-analysis. BMC Complement Altern Med. 2011;11:70.

[14] Al-Boloushi Z, Alsharji K, Matar A, Ahmed M. Effectiveness of cupping therapy in treating chronic shoulder pain: a randomized controlled trial. J Bodyw Mov Ther. 2021;25:70–6.

[15] Lauche R, Cramer H, Hohmann C, Choi KE, Rampp T, Musial F, et al. The effectiveness of cupping therapy on chronic neck and shoulder pain: a randomized controlled trial. Evid Based Complement Alternat Med. 2012;2012:429718.

[16] Lim ECW, Tay MGX. Kinesio taping in musculoskeletal pain and disability that lasts for more than four weeks: is it time to peel off the tape and throw it out with the sweat? A systematic review with meta-analysis. Br J Sports Med. 2015;49(24):1558–66.

[17] Kim J, Lee JH, Lee DH, Yoon SH. Effects of myofascial cupping therapy on pain and function in patients with rotator cuff tendinopathy. J Back Musculoskelet Rehabil. 2017;30(4):793–800.

[18] Halim NH, Mohamed NA, Che Has AA. Immediate effects of kinesiotaping on scapular upward rotation and shoulder function in overhead athletes with scapular dyskinesis: A pilot study. J Bodyw Mov Ther. 2018;22(2):460–7.