How does massage therapy affect the range of motion of the shoulder joint?

Original Article

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Abstract.

Background This research investigates the impact of massage therapy on enhancing shoulder joint range of motion (ROM) in individuals suffering from shoulder pain. Such pain is frequently linked to reduced joint mobility, which can hinder daily functioning and diminish overall quality of life. Massage therapy is well-established for its benefits in easing muscle tension, improving circulation, and fostering relaxation—factors that collectively aid in increasing joint flexibility.

Objectives The study utilized a pre-experimental design featuring a one-group pretest-posttest format.

Methods A pre-experimental design with a one-group pretest and posttest approach was adopted. This study involved patients of Insan Terapi Fisik who had experienced shoulder pain injury within the past two months. Individuals with shoulder discomfort participated in routine massage therapy sessions over a specified duration. ROM measurements of the shoulder joint were conducted before and after the intervention using validated assessment tools.

Results Statistical evaluation through paired t-tests showed a significant enhancement in ROM post-treatment ($p = 0.001 < 0.05$). The results affirm that massage therapy on its own effectively improves shoulder joint mobility and can serve as a valuable rehabilitation strategy.

Conclusion this study enriches existing literature on manual and non-pharmacological therapies for musculoskeletal disorders and provides practical guidance for healthcare practitioners by highlighting massage therapy as an affordable, accessible, and low-risk method for restoring joint function in patients with shoulder pain.

Keywords: massage therapy, joint range of motion, shoulder pain.

Received: April 18, 2025. Accepted: June 24, 2025

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INTRODUCTION

Physical activity is widely recognized as a foundational component of human life [1] and plays a crucial role in promoting physical growth and development across all age ranges, from children to older adults [2]–[4]. Numerous investigations have highlighted the positive outcomes of engaging in physical activity, particularly through sports participation, on enhancing overall physical fitness [5], [6]. Involvement in physical activity contributes to better physical, psychological, and emotional well-being [7], while also serving as a preventive measure against various diseases [8], [9]. However, it is important to consider that excessive training loads may elevate the risk of sports-related injuries [10], [11].

Among these injuries, upper extremity conditions such as shoulder pain are particularly common in both recreational and professional sports, and often present challenges in terms of diagnosis and treatment [12]. Shoulder pain is one of the most frequently reported musculoskeletal complaints managed by physiotherapists [13]. Its high prevalence—especially in physically demanding and contact-intensive sports like handball, judo, and court tennis—emphasizes the need for deeper understanding and more effective treatment strategies [14].

Individuals who suffer from shoulder pain frequently experience restricted joint range of motion, which can adversely affect daily functioning and overall quality of life. In response to this issue, several therapeutic interventions have been proposed, including massage therapy and heat therapy. Massage therapy is known for its effectiveness in relieving muscular tension, increasing blood flow, and accelerating recovery processes [15], [16], whereas heat therapy has been shown to alleviate muscle

stiffness, enhance tissue elasticity, and reduce pain [17]. It is anticipated that combining these two treatments may offer enhanced therapeutic effects through their complementary mechanisms.

Previous research has demonstrated that pairing massage therapy with ultramagnetic therapy can improve joint flexibility and mobility [18], while heat therapy alone has shown positive outcomes in terms of muscle relaxation and joint function enhancement [17], [19]. Nonetheless, there remains limited evidence focusing specifically on the combined use of massage therapy and heat therapy in improving joint range of motion in individuals with shoulder pain. On the other hand, studies involving the integration of intermittent physical exercise and sports massage have reported benefits such as improvements in performance metrics (e.g., standing long jump, sit-up), better control of physiological variables (e.g., blood pressure, BMI), increased self-confidence, and reduced suicidal ideation [20].

Given the importance of identifying effective treatment approaches, this study aims to provide valuable insights by investigating the impact of massage therapy on improving shoulder joint range of motion. The results of this study are expected to support the development of more effective and tailored clinical interventions for individuals experiencing shoulder pain with limited mobility.

METHOD

Participants.

This study involved patients of Insan Terapi Fisik who had experienced shoulder pain injury within the past two months. Purposive sampling was employed, considering individuals with shoulder pain willing to participate and experiencing decreased movement function. A total of 15 participants, comprising 11 males and 4 females, received the treatment. The age range of the participants varied from 17 to 35 years.

Procedure.

A pre-experimental design with a one-group pretest and posttest approach was adopted. Initially, a pretest was conducted to establish baseline data on joint range of motion among individuals with shoulder pain. Subsequently, the researcher analyzed the pretest data, serving as baseline measurements. The intervention, consisting of massage therapy and heat therapy, was administered twice a week for three weeks. Following the treatment period, a final measurement (posttest) was conducted.

The primary instrument for measuring joint range of motion (ROM) was the goniometer, focusing on flexion and abduction movements. ROM data were collected before the commencement of combined massage therapy and heat therapy and after the completion of treatment sessions.

Data Analysis.

Descriptive analysis was performed to summarize the research data and facilitate its presentation. Data following a normal distribution underwent t-test analysis to determine the mean difference between pretest and posttest outcomes and their statistical significance. SPSS 26 software was used for these analyses.

RESULTS AND DISCUSSION

Results

Table 1 presents the outcomes of two normality tests, Kolmogorov-Smirnov and Shapiro-Wilk, conducted on four different ranges of motion (ROM): Abduction Pretest, Abduction Posttest, Flexion Pretest, and Flexion Posttest. The results indicated that for certain ranges of motion, the data did not adhere to a normal distribution (Sig. <0.05). This information is crucial for evaluating the appropriateness of statistical tests, prompting the use of nonparametric tests. The detailed results can be observed in table 1.

In Table 2, the highlighted section illustrates the findings from a study assessing the efficacy of combined massage and heat therapy on joint range of motion in patients with shoulder pain. For the abduction test, there were no negative ratings or ties. The positive rating was 15 degrees, with an average rating of 8.00 and a total rating of 120.00. Similarly, the flexion test section displayed no negative ratings or ties, with a positive rating of 15 degrees, an average rating of 8.00, and a total rating of 120.00. These results indicate that the combination of massage therapy and heat therapy effectively enhances joint range of motion in patients with shoulder pain, as evidenced by the positive ratings in both tests.

Table 3 presents the Wilcoxon test data, revealing the outcomes of a study investigating the impact of combining massage therapy and heat therapy on joint range of motion in individuals with shoulder pain. A negative "z" value indicates a reduction in the range of motion following the therapy. Additionally, the results demonstrate a statistically significant effect of the therapy on the range of motion, with a significance level of 0.001. Thus, it can be inferred from these findings that the combined approach of massage therapy and heat therapy significantly improves the abduction and flexion range of motion in patients with shoulder pain. Detailed results can be found in table 3.

Table 1. Normality Test Results

ROM	Kolmogorov-Smirnov[a]			Shapiro-Wilk		
	Statistic	df	Sig.	Statistic	df	Sig.
Abduction Pretest	0.290	15	0.004	0.790	15	0.002
Abduction Posttest	0.222	15	0.124	0.889	15	0.067
Flexion Pretest	0.280	15	0.160	0.881	15	0.030
Flexion Posttest	0.260	15	0.016	0.803	15	0.004

Table 2. Wilcoxon Signed Ranks Test

Result	ROM	N	Mean Rank	Sum of Ranks
Abduction Posttest - Abduction Pretest	Negative Ranks	0[a]	0.00	0.00
	Positive Ranks	15[b]	8.00	120.00
	Ties	0[c]		
	Total	15		
Flexion Posttest - Flexion Pretest	Negative Ranks	0[d]	0.00	0.00
	Positive Ranks	15[e]	8.00	120.00
	Ties	0[f]		
	Total	15		

Table 3. Wilcoson Effect Test Results

ROM Result	Abduction Posttest - Abduction Pretest	Flexion Posttest - Flexion Pretest
Z	-3.409[b]	-3.412[b]
Asymp. Sig. (2-tailed)	0.001	0.001

Table 4. Descriptive Results of Flexion and Abduction ROM

Result	N	Range	Minimum	Maximum	Mean	Std. Deviation
Abduction Pretest	15	48	121	169	140.80	18.865
Abduction Posttest	15	30	150	180	169.60	9.891
Flexion Pretest	15	47	121	168	142.80	17.486
Flexion Posttest	15	20	160	180	171.33	8.616

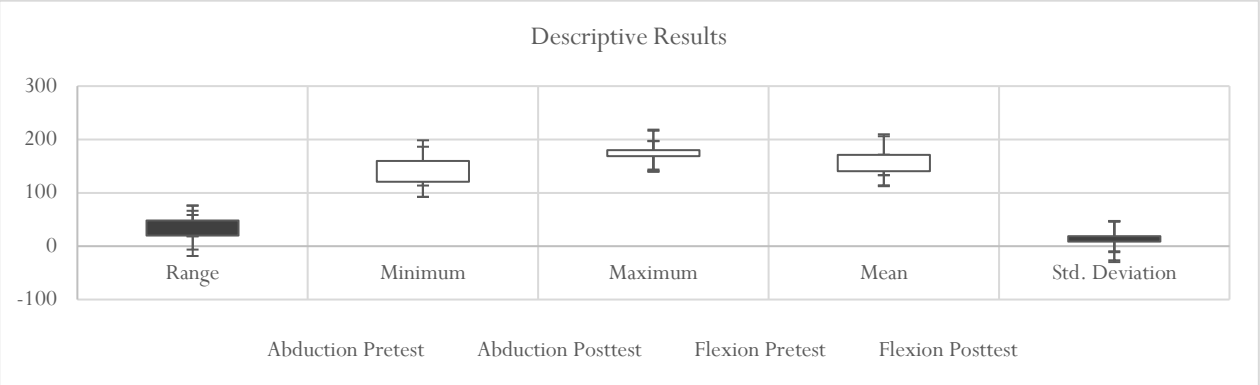

Figure 1. Descriptive Results of ROM in Shoulder Pain Patients

Based on the data provided earlier, it is evident that there is an improvement in the range of motion (ROM), particularly in flexion and abduction, following the application of combined massage therapy and heat therapy. The post-test results reveal a mean abduction movement of 169.60 and a mean flexion movement of 171.33. Further details can be found in Table 4 and visualized in Figure 1.

Discussion

The primary objective of this study is to demonstrate the effectiveness of massage therapy in managing shoulder pain. Findings suggest that the application of massage therapy leads to improvements in joint range of motion, as evidenced by increased mean values in both pretest and posttest assessments among individuals with shoulder pain. Statistical analysis using the t-test revealed that the computed value surpasses the critical threshold from the t-distribution table, while the significance test further confirms the notable effect of the intervention. These results emphasize that consistent use of massage therapy significantly alleviates shoulder pain and enhances joint mobility.

These outcomes strongly support the integration of massage therapy—along with heat therapy—into rehabilitation programs for shoulder pain. Similar conclusions have been drawn in related studies, such as those involving the combined application of massage and ultramagnetic therapy, which have proven effective in reducing pain and improving joint function [18]. In addition, research on traditional Thai massage (TTM) conducted over a four-week intervention period has shown reductions in pain severity, elevation in pain thresholds, and improved cervical and lateral flexion [21].

Previous studies have also shown that massage therapy assists in repositioning joints without friction, thereby contributing to the restoration of normal range of motion and reducing joint stiffness [11]. The dual application of massage and heat therapies has demonstrated overall benefits for post-injury body recovery. Beyond musculoskeletal concerns, massage therapy has been found to provide therapeutic effects for stress management and a range of health conditions such as premature birth, dermatological issues, arthritis, and fibromyalgia [22]–[24].

Massage therapy's benefits extend into the realm of athletic performance, where its effectiveness has been well documented [25]. Moreover, studies have found that massage therapy can trigger neuroplastic responses in the somatosensory cortex, facilitating injury healing and the repair of peripheral nerves [26]. Collectively, these findings underscore massage therapy's essential role in post-injury rehabilitation.

Furthermore, the proactive use of gabapentinoids has been recognized as an effective strategy for enhancing postoperative rehabilitation outcomes—particularly after laparoscopic cholecystectomy—by easing shoulder pain, reducing postoperative nausea and vomiting (PONV), and promoting better sleep quality during the initial recovery phase [27].

In the context of young tennis athletes, maintaining stable training loads has been associated with a lower incidence of shoulder complaints, indicating the need for early monitoring and intervention strategies [14], [28]. Based on this body of evidence, the current study supports the use of massage therapy, in conjunction with heat therapy, as a promising and effective method for rehabilitating individuals with shoulder pain.

CONCLUSION

The results of this study confirm that massage therapy has a positive impact on enhancing joint range of motion in individuals suffering from shoulder pain. Limitations in movement are a common issue among patients with shoulder pain, often interfering with their ability to perform daily tasks and diminishing their quality of life. Massage therapy, which is effective in reducing muscle tightness and improving circulation, complements the benefits of heat therapy, particularly in reducing stiffness and increasing tissue flexibility. This research shows that when used in combination, these therapies offer superior improvements in joint mobility compared to when each is applied in isolation. The enhanced outcomes observed are likely the result of a synergistic interaction between the two methods—working simultaneously to relax muscles, stimulate blood flow, and soothe the affected area. These findings provide scientific support for incorporating massage therapy into shoulder pain management protocols aimed at restoring joint mobility. They also emphasize the importance of individualized treatment plans, taking into account the patient's specific condition and severity of limitation.

Although the findings suggest notable effectiveness, personalized care remains essential. Each intervention should be adapted to the unique needs of the patient, and professional consultation is strongly recommended before initiating a combined therapeutic approach. Overall, this study contributes valuable insights to guide future clinical applications and serves as a foundation for further

investigation and refinement of treatment guidelines in the context of shoulder pain and joint mobility restoration.

ACKNOWLEDGMENT

The author would like to thank many parties who have helped, especially the owner of Insan Terapi Fisik who has given permission to conduct this research.

AUTHOR CONTRIBUTION STATEMENT

DS played a role in the study design and planning, data collection, and data analysis and interpretation. QBS assisted in Manuscript preparation and Obtaining funding.

CONFLICT OF INTEREST AND FUNDING

There is no conflict of interest

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