



# Effectiveness of the Effriction Method in Increasing Range of Motion (ROM) in Shoulder Injuries

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**Abstract.** The aim of the research was to test the level of effectiveness of the effriction method in helping the recovery process increase the range of motion (ROM) of the shoulder joint in athletes or people who enjoy sports who have suffered sports injuries. The high percentage of shoulder injury cases was caused by sports activities, reaching 46.3% compared to other injuries during May 2024. The method used in the research was pre-experimental with a one group pretest-posttest design. A total of 30 people as samples were selected using the purposive sampling method. The ROM of people who have been injured before and after is measured using a movement goniometer which measures various movements including flexion, extension, adduction, abduction, internal rotation and external rotation. When there is limited range of motion of the joint then it is treated using the effriction method using the thumb and palms, aims to relax muscles with the aim of reducing tension in the shoulder joint. The results of the study were analyzed using the mean difference test (t-test) showing a significant increase in ROM ( $p < 0.05$ ) after treatment. The sequential increase in ROM was flexion by 15.79%, extension by 10.07%, adduction by 12.19%, abduction by 20.69%, internal rotation by 8.65%, and external rotation by 8.46%. The results of this study show that there is a significant change in the effriction method in increasing the range of motion of the shoulder joint in athletes or sportsmen who have experienced injuries.

**Keywords:** Effriction, Shoulder Injuries, ROM

## 1 Introduction

Physical activity carried out by each person is any body movement that results in the release of energy. The higher the physical activity, the greater the risk of injury, both upper and lower extremity injuries. Especially the upper extremity area. The shoulder joint is a very mobile part and is susceptible to injury. Shoulder injuries in flexion, abduction, and rotator cuff injuries can occur in sports related to badminton, volleyball, tennis, and basketball (1).

Injury is defined as damage to the structure or function of the body due to physical force or pressure. Injuries or injuries can initially be interpreted as violent events that attack body tissue suddenly, very hard and serious impact (2). Sports injuries are damage to the body characterized by pain, heat, redness, swelling, and inability to function

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muscles, tendons, ligaments or bones normally due to excessive movement or accidents. Injuries must receive appropriate professional help. Athletes experience chronic injuries that begin with overuse syndrome, especially excessive load, which occurs continuously over a long period of time and inadequate recovery (3).

Handling of injuries experienced by both athletes and non-athletes must be carried out appropriately and in accordance with correct injury management based on SOP (4). In general, injuries are divided into 2, namely acute trauma and overuse syndrome. An acute injury is a serious injury that occurs suddenly, such as torn ligaments, muscles, tendons, sprains, or even broken bones. Overuse syndrome commonly occurs in athletes or sportsmen, starting with slightly excessive force but continuing repeatedly over a long period of time. The characteristics of the body in a state of injury are as follows: redness (rubor), swelling (tumor), and heat (kolor), pain (dolor), and functional disorders (functiolaesa) (5). Injury management includes several actions, namely sports rehabilitation therapy, which uses the approach of providing sports treatment as a post-injury method. This includes the use of herbal therapy, massage, thermotherapy, cold therapy, hydrotherapy, yoga, exercise therapy, and various other techniques (6).

Range of Motion (ROM) is a physical parameter related to the movement ability of the body's joints. ROM refers to the maximum range of motion that can be performed in a joint without causing the perception of pain. ROM training is an exercise option that can be chosen by athletes or sportsmen who have limited joint movement. ROM exercises can be done in a sitting, standing, or lying position in bed (7).

ROM mobilization is an individual's ability to move freely, easily and regularly according to the angle of each joint to meet physical activity needs. In the context of shoulder joint movement, there are six ways of measuring that can be done: flexion: raising the arm from a position next to the body to the front to above the head with a range of motion of 180°, extension: moving the arm behind the body while keeping the elbow straight with a range of motion 45-60°, abduction: raise the arm to a sideways position above the head with the palm away from the head with a range of motion of 180°, adduction: lower the arm to the side and cross the body as far as possible with a range of motion of 40°, internal rotation: rotate the shoulder with elbow bent so that the arm moves so that the thumb faces inward and backward with a range of motion of 90°, external rotation: rotating the arm with the elbow bent so that the thumb moves up and to the side of the head with a range of motion of 90°(8).

**Table 1.** Standard table for measuring ROM (Range of Motion) values

<i>Normal ranges of shoulder motion</i>	
<i>Flexion</i>	180
<i>Extension</i>	60
<i>Abduction</i>	180
<b><i>Adduction</i></b>	45

<i>Internal rotation</i>	90
<i>External rotation</i>	50

(Robert E. McAtee. 2014. page 134)

Based on field data at the Arif Setiawan sports injury massage clinic, patient data from November 2023-January 2024 shows that there are 379 patients who came in with injuries to the upper extremities. The age ranges that experienced injuries were adults (26-45 years) with a percentage of 42.2% (160 patients), teenagers (12-25 years) with a percentage of 27.4% (104 patients), pre-elderly ages (46 -55 years) with a percentage of 16.1% (61 patients), elderly age (56 years and over) with a percentage of 14.2% (54 patients), children (5-11 years) with a percentage of 0% (0 patients). Apart from the age range, it was divided into gender, namely men with a percentage of 85.2% (323 patients), and women with a percentage of 14.8% (56 patients). Apart from that, the percentage data on patient injury types is included, namely 67.3% (255 patients), elbow injuries with a percentage of 12.7% (48 patients), wrist injuries with a percentage of 12.1% (46 patients), neck injuries with a percentage of 6.3% (24 patients), and finger injuries with a percentage of 1.8% (7 patients). Based on the data that emerged, the most common non-specific injuries were shoulder injuries with a percentage of 67.3% (255 patients) out of a total of 379 patients who experienced injuries to the upper extremities, for this reason the research focused on non-specific shoulder injuries.

## 2 Method

The research design used for this research is Pre-Experimental Design and uses the one-group pre-test post-test design method. Pre-Experimental Design

**O<sub>1</sub> X O<sub>2</sub>**

one-group pre-test post-test design (Hardani. 2022. Page 350)

Information:

O<sub>1</sub> = pre-test used to measure the ROM value of the shoulder joint with a goniometer measuring instrument before treatment is given to shoulder injury patients at the sports injury massage clinic.

X = providing treatment using the effriction massage method to shoulder injury patients at the sports injury massage clinic.

O<sub>2</sub> = post-test used to measure the ROM value of the shoulder joint with a goniometer measuring instrument after treatment was given to shoulder injury patients at the sports injury massage clinic.

The pre-test measured ROM in the shoulder joint using a goniometer measuring movement in flexion, extension, abduction, adduction, medial rotation and lateral rotation in patients with shoulder injuries. After the pre-test, a massage treatment was carried out with an estimated duration of 15-20 minutes using the effriction massage method for shoulder injury patients. Followed by a post test for shoulder joint ROM

Of the total shoulder injuries, 255 patients were divided according to gender with a total of 198 patients (77.6%) male, and 57 patients (22.4%) female. After that, 198 male shoulder injury patients were taken as samples and divided according to age range, namely adults 26-45 years as many as 67 patients (33.8%), teenagers 12-25 years as many as 48 patients (24.2%), pre There were 42 patients aged 46-55 years, 41 patients aged 56 years and over, and 0 patients aged 5-11 (0%). Of the total adult patients, 67 patients were further divided according to the cause of injury, namely sports for 31 patients (46.3%), excessive activity for 17 patients (25.4%), excessive lifting for 9 patients (13.4%), accidents for 6 patients (9%), hard impacts were 4 patients (6%). From the results of the total number of patients taken based on the cause of injury, the most frequent was due to sports with a total of 31 patients and the number of samples to be taken using the sample calculation technique from the Yamane formula (Sugiyono, 2022: 143). The minimum number of samples taken was 30 patients with an age range of 35-55 years who experienced complaints of shoulder injuries caused by exercise and had an impact on decreasing range of motion (ROM).

This test is carried out by measuring the range of motion (ROM) in patients with shoulder injuries and carrying out the test using a tool called a goniometer. A goniometer is used to determine the exact position of the joint and the total range of movement that may occur in that joint (Irfan et al., 2013). The validity of the goniometer is 0.85 and the reliability of the goniometer is 0.94 (Pavlicevic, 2012).

Analysis of this data uses the t-test, a statistical technique used to assess whether the difference between two means originating from two different distributions is significant. There are two types of t-test, namely the t-test for independent samples and the t-test for paired samples. In this study, we will use the t-test for paired samples, which will compare the differences between pretest and posttest results on the same subject. The criteria used to determine significance are if the value is greater than 0.05 ( $> 0.05$ ), then it is considered significant, whereas if the value is less than 0.05 ( $< 0.05$ ), then it is considered not significant.

### 3 Results

Statistical data in the form of a histogram shows a minimum value of 35.00, a maximum value of 54.00, a mean of 42.47, a median of 42.50, a mode of 37.00, a range of 19.00, and a variance of 34.74. For age, the first highest percentage who complained of frozen shoulder was 20% at the age of 37 years, followed by 16.7% at the age of 47 years. Meanwhile, the lowest percentage were five people in the age range 41 years to 43 years, 49 years and 54 years, each at 3.3%.

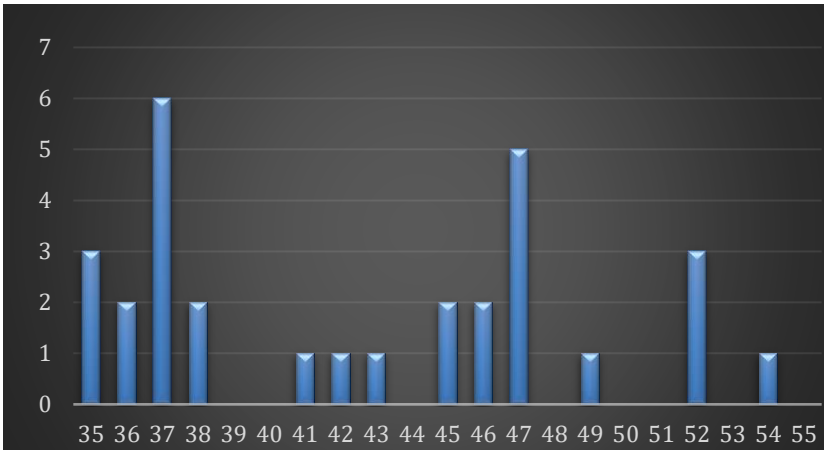


Figure 1. Data Statistic

The Normality Table shows that all data has a p value (Sig.) greater than 0.05 (> 0.05), which indicates that all variables have a normal distribution. In other words, because the significance value is greater than 0.05, it can be concluded that the data is normally distributed.

Table 2. Normality Test

Item Test	P	Sig.	
<i>Pretest flexion</i>	0,985	0.05	Normal
<i>Posttest flexion</i>	0,867	0.05	Normal
<i>Pretest extention</i>	0,396	0.05	Normal
<i>Posttest extention</i>	0,718	0.05	Normal
<i>Pretest adduction</i>	0,232	0.05	Normal
<i>Posttest a adduction</i>	0,718	0.05	Normal
<i>Pretest abduction</i>	0,710	0.05	Normal
<i>Posttest abduction</i>	0,299	0.05	Normal
<i>Pretest internal rotation</i>	0,523	0.05	Normal
<i>Posttest internal rotation</i>	0,585	0.05	Normal
<i>Pretest external rotation</i>	0,593	0.05	Normal
<i>Posttest external rotation</i>	0,549	0.05	Normal

In the homogeneity table you can see the Sig value.  $p > 0.05$  and  $F_{levene} < F_{table}$  (3.37), so the data can be said to be homogeneous.

Table 3. Homogeneity Test

Item Test	F table	F levene	P	
<i>Pretest flexion</i>	3.37	0,509	0,679	Homogen
<i>Posttest flexion</i>	3.37	0,550	0,584	Homogen

<b>Item Test</b>	<b>F table</b>	<b>F levene</b>	<b>P</b>	
<b>Pretest extention</b>	3.37	1,380	0,271	Homogen
<b>Posttest extention</b>	3.37	0,840	0,484	Homogen
<b>Pretest adduction</b>	3.37	1,630	0,207	Homogen
<b>Posttest a adduction</b>	3.37	1,426	0,258	Homogen
<b>Pretest abduction</b>	3.37	1,140	0,351	Homogen
<b>Posttest abduction</b>	3.37	0,419	0,746	Homogen
<b>Pretest internal rotation</b>	3.37	1,630	0,207	Homogen
<b>Posttest internal rotation</b>	3.37	2,440	0,087	Homogen
<b>Pretest external rotation</b>	3.37	1,630	0,207	Homogen
<b>Posttest external rotation</b>	3.37	1,136	0,353	Homogen

In the Hypothesis Table, it is found that the posttest flexion value (125.07) is > the pretest flexion value (108.93). The results of the analysis show that all data have a p value (sig.) that is > (0.000), and the p value (0.000) is < 0.05. This shows an increase in range of motion in the shoulder joint in patients with complaints of shoulder injuries.

Table 4. Hypothesis test

<b>Item Test</b>	<b>Average</b>	<b>Sig (2-tailed)</b>
<b>Pretest flexion</b>	108,93	0,000
<b>Posttest flexion</b>	125,07	0,000
<b>Pretest extention</b>	37,13	0,000
<b>Posttest extention</b>	40,50	0,000
<b>Pretest adduction</b>	35,37	0,000
<b>Posttest a adduction</b>	39,33	0,000
<b>Pretest abduction</b>	106,27	0,000
<b>Posttest abduction</b>	127,20	0,000
<b>Pretest internal rotation</b>	72,80	0,000
<b>Posttest internal rotation</b>	78,37	0,000
<b>Pretest external rotation</b>	69,70	0,000
<b>Posttest external rotation</b>	74,90	0,000

## 4 Discussion

The aim of the study was to determine whether there was an increase in the range of motion in non-specific shoulder joint injuries. Effriciton is a therapeutic technique that combines massaging movements (effleurage) and rubbing movements (friction) simultaneously with light and fast pressure. The effleurage technique can be performed on various parts of the body using the palms or fingers. Meanwhile, the friction technique has been proven to be useful for increasing blood circulation, increasing body temperature, accelerating lymphatic flow, relieving muscle fatigue, and accelerating tissue healing. The application of massage therapy to shoulder injuries using the effriciton massage technique involves combining effleurage and friction movements using the thumb and palm. The goal is to relax stiff muscles and reduce tension in non-specific shoulder injuries.

Based on the results of this research, in the experimental group that received temporary effriciton treatment with a treatment duration of 15-20 minutes, there was a significant difference between the values before and after treatment, with a p value (0.000) <0.05. Therefore, it can be concluded that effriciton significantly influences the increase in range of motion in people who experience non-specific shoulder injuries.

Comparison between the average pretest and posttest changes in the experimental group showed a significant increase in the range of motion (ROM) of the shoulder joint in patients who experienced shoulder sports injuries. The data shows that the average pretest flexion is 108.930 and the average posttest flexion is 125.070. The analysis confirmed that effriciton treatment was effective in increasing the range of motion of the shoulder joint in patients with shoulder sports injuries, characterized by a significant increase in ROM.

Based on the p value (0.000) which is <0.05, it can be concluded that there is a significant increase in range of motion in non-specific shoulder injuries. Effriciton is a therapeutic technique that combines massaging movements (effleurage) and rubbing movements (friction) simultaneously with light and fast pressure. Thus, effriciton can be used to relieve pain that occurs in the muscles and increase the range of motion (ROM) in the shoulder joint of patients who have suffered shoulder sports injuries.

## 5 Conclusion

The research conclusion is that there is a significant difference in the effectiveness of increasing range of motion in shoulder joint injuries through the use of the effriciton massage method in patients who have non-specific shoulder sports injuries. The results of this study have practical implications for patients who experience non-specific shoulder sports injuries, these results will provide insight into effective ways to reduce pain and discomfort caused by limited range of motion in the shoulder joint. The effriciton method can help the healing process of non-specific shoulder injuries caused by sports with limited range of motion in the shoulder joint. This requires masseurs or

massagers to continue to improve their knowledge and skills in using the effriction method, and is an opportunity to learn more and carry out research. further in the field of massage treatment.

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