



# A comparative study of modified sleeper stretch verses conventional theraband exercises in badminton players to reduce shoulder pain

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## Abstract:

**Background:** Badminton is a sport that requires a lot of overhead shoulder motion. Abduction, internal and external rotation of the shoulder joint during shots, lobbing, stroking and smashing were the cause of the injury. Shoulder pain and impingement of the rotator cuff caused by anterior instability of the shoulder joint are frequent problems for the athletes engaged in overhead motion. Painful shoulder conditions have been studied in tennis, baseball and swimming.

**Materials and Methods:** In this study, subjects were randomly assigned to two intervention groups. The Study Design was Experimental in nature. The participants were recruited on the basis of inclusion and exclusion criteria using the purposive sampling. The sample of the study comprised 20 students. Each group consist 10 subjects. The experimental group (A) – 10 by using sleeper stretch and strengthening exercise. Control group (B) – 10 by using general warm up exercise who fulfilled the inclusion and exclusion criteria.

**Results:** The result depict that values of pre-test post- test VAS scores reduced significantly thus concluding experimental Group was significant than control group. The experimental group A is highly significant than control group B.

**Conclusion:** This study concluded that group A intervention ie. modified sleeper stretch with strengthening exercise is effective in reducing pain of shoulder joint among Badminton players during overhead movement after six weeks of intervention.

**Key Word:** Sleeper Stretch, VAS, Badminton, Shoulder pain

## INTRODUCTION

Badminton is one of the most widely-played sports in the world. Badminton is a sport that requires a lot of overhead shoulder motion. Abduction, internal and external rotation of the shoulder joint during shots, lobbing, stroking and smashing were the cause of the injury. The overhead throwing athlete is an extremely challenging patient in sports medicine due to the high forces, repetitive nature, and extreme ranges of motion observed during the throwing motion. (Nasreen Ashraf, 2020; Michael M Reinold, 2013 )

The overhead throwing is an extremely challenging situation in sports medicine due to the high forces, repetitive nature, and extreme ranges of motion observed during the throwing motion. The cumulative micro traumatic stresses placed on the athlete's shoulder joint complex challenges the physiologic limits of the surrounding tissues and often compromises the static stabilizers of the joint, leading to shoulder instability in these athletes [1]. Overhead activities can be termed as movements that require repetitive motions with the arm in at least 90 degrees of forward flexion or abduction or a combination of the two. Athletes participating in activities such as swimming, tennis or throwing sports are likely to have repetitive trauma to the shoulder based on the frequency related to the age of the athlete and level of competition. They usually present with hyperlaxity of the glenohumeral joint due to an increased anterior laxity of shoulder capsule, required for performance of overhead actions in the sports leading to compensatory tightness of the posterior capsule [2].

Athletes who participate in overhead sports activities requiring ballistic shoulder rotation like in the baseball, softball, tennis, volleyball present with posterior shoulder tightness.<sup>3</sup> Also in an individual, non-contact sport like badminton requires a combination of jumps, lunges, quick changes in direction and rapid arm movements from a wide variety of postural positions. During such movements, the body may be exposed to various forms of injuries [4]. Badminton is considered a low- risk sport compared with many other sports. Shoulder pain and impingement of the rotator cuff caused by anterior instability of the shoulder joint are frequent problems for the athletes engaged in overhead motion. Painful shoulder conditions have been studied in tennis, baseball and swimming [5].

Research and clinical observations have shown that posterior shoulder tightness leads to various kinematic alterations, like decreased shoulder internal rotation, horizontal adduction, abduction, flexion and increased external rotation. These alterations is linked to bony and soft tissue adaptations resulting from the large rotational and distractive forces acting on the glenohumeral joint during the throwing motion. These vulnerability of the shoulder during repetitive overhead motions results in soft tissue micro trauma leading to shoulder lesions [6].

Posterior shoulder tightness of the shoulder has been suggested as one of the causative factor for shoulder impingement syndrome, labral lesions & cuff pathology. The abnormal humeral head motion can result in a decrease in the subacromial space during overhead activities leading to compression of tissues in that region which can ultimately manifest as a SICK scapula (scapular malposition, inferio-medial angle scapular winging, coracoid tenderness & scapular dyskinesia). It is also suggested that contracture of the posterior- inferior glenohumeral capsule, evidenced by a lack of internal rotation with the arm abducted to 90°, is an essential cause of superior labral lesions [7].

In order to rehabilitate athletes with disorders associated with posterior shoulder tightness, lengthening of

soft tissues in the posterior aspect of the shoulder is essential to ensure proper shoulder range of motion, kinematics and kinetics [3].

Stretching exercises are regularly included in warm up and cool down of all physical activities as a standard practice for all levels of competitive or recreational sports [8]. Physicians, physiotherapists and trainers recommend stretching in order to enhance performance and prevent injuries as stretching are believed to improve flexibility.

The sleeper stretches can be performed as self-stretching by the athlete, but when the athletes perform these stretches independently on the field as a warm-up or cool-down routine, the stretch will not be effective because the scapula is not stabilized and therefore the stretch is imparted to the scapula-thoracic tissues as well as tissues crossing the gleno- humeral joint [7].

More recently, researchers have described a “sleeper stretch” that is accomplished by lying on the side to be stretched. The side -lying position enables stabilization of the scapula against the upper body and the treatment surface, thereby enabling more isolation of the posterior glenohumeral joint. The sleeper stretches can be performed independently without the use of the treatment table. Specifically, these stretches can be performed while standing and having the athlete lean against a rigid wall.10

The aim of the study is to find the effectiveness of modified sleeper stretch to reduce pain of shoulder joint in Badminton players.

## **METHODOLOGY:**

**Study setting:** Physiotherapy Centre at selected Hospital. The Study Design is Experimental study design. The purposive sampling technique was adapted based on the following inclusion and exclusion criteria. The subjects were randomly selected 20 students. Each group consist 10 subjects. The experimental group (A) – 10 by using sleeper stretch and strengthening exercise. Control group (B) – 10 by using conventional strengthening exercise using thera band who fulfilled the inclusion and exclusion criteria. The Variables: Dependent variables are pain whereas independent variables: Sleeper stretch with strengthening exercise

### **Inclusion criteria:**

1. Pain limit sports function,
2. Pain on palpation,
3. Male population,
4. Age group between 14 – 18 years,

### **Exclusion criteria:**

1. Acute / chronic injuries, Fracture (or) any dislocation at the site,
2. Any inflammation / infections joints,
3. Underwent any recent surgeries,
4. Neurological and Psychological disorders.

The duration of study was 6 weeks. Subjects in both the stretching groups were shown their assigned exercises. The researcher first demonstrated and explained the appropriate stretching techniques, instructions to each participant was given & they were asked to demonstrate the same and explained the appropriate

stretching techniques, instructions to each participant was given & they were asked to demonstrate the same. Players involved in any other sport, who work in occupations involving heavy manual work, with a history of shoulder pain, fracture or dislocation within less than one year, had shoulder surgery and those who were undergoing physiotherapy treatment were excluded from the study. (Nasreen Ashraf, 2020)

**Orientation to the subject:** Before collection of data, all the subjects were explained about the purpose of study. The investigator has to give a detailed orientation about the various test procedures such as Visual analogue scale to measure pain. The concern and full co-operation of each participant was sought after complete explanation of the procedure involved in the study.

Visual Analog scale (VAS) is used as outcome measures. Visual analog scale consists of 10 cm horizontal line with 2 end points, labeled no pain and worst pain respectively. The patient is requested to place a mark on the 10 cm line to know his pain intensity at that particular time (presently feeling). The distance in cm from the lower end of visual analog scale to the patient’s mark is used as a numerical index of the severity of pain.

**Intervention**

**GROUP A:** The modified sleeper stretch was performed by lying on the side to be stretched, with the stretching arm and elbow flexed to 90°, with the lateral border of the scapula positioned firmly against the treatment table then passively internally rotating the humerus with the opposite arm. The stretch was repeated 3 times and held for 30 seconds with 30 seconds of rest period. (Nasreen Ashraf, 2020).

**GROUP B:** Conventional strenghtening exercise using thera band.

Internal and external rotaion of shoulder with elbow 90° flexed in mid prone position. Dosage: 10 reps with 10 sec Hold × 2 sets.

**Results:**

PAIN IN VAS		MEAN	STAN DARD DEVI ATIO N	T - VALUE	P-VALUE	SIGNIFICANCE
<b>GROUP - A EXPERIMENT AL GROUP</b>	PRE- TEST	4.21	1.435	5.302	0.04	P < 0.1 At 99.9% Confidence Level is highly significant
	POST- TEST	1.34				

<b>GROUP-B CONTROL GROUP</b>	PRE- TEST	4.199	0.3095	1.112	0.73	P < 0.01 At 99.9% Confidence Level is very highly significant
	POST- TEST	3.58				

The table shows p- value and t- value of VAS using paired t-test of both experimental and control group. The participants within the experimental group p-value of pain is 0.04 ie. Significant while, the participants of the control group p-value of pain is 0.73 i.e. Non- significant. Paired *t*-Test was performed to analyze the differences in pre and post-test values of VAS in experimental group is 5.302 that depicts significant reduction in pain of individuals. The experimental group A is significant than control group B.

The result of this study was to explain that subjects with reduce pain of shoulder joint by giving modified sleeper stretch and strengthening exercise for Badminton players in high school students.

There is significant improvement to reduced pain of shoulder joint of male Badminton players hence I rejected the null hypothesis.

Subjects had little knowledge and experience with stretching and completed a 6-weeks strengthening exercises.

The data were analyzed to determine strengthening exercise protocol has better improved in internal rotation of shoulder in overhead athletes.

**In the present study**, age group participated was between 14 – 18 years. 20 subjects were selected who fulfilled the predetermined inclusive and exclusive criteria. The subjects were divided into groups, 10 in each group. Control group underwent only strengthening exercise and experimental group underwent modified sleeper stretch and strengthening exercise.

**Statistical analysis** using unpaired *t*-test showed that there was significant difference between two groups in reducing the pain among Badminton players. The paired t-test concluded that there was a significant improvement in VAS of experimental group, which was supported by studies as follows.

The result of the present study will help clinicians to imbibe the current experimental technique ie. Sleeper stretch and strengthening exercise to reduce pain among other athletes too.

### CONCLUSION:

This study investigated the effectiveness of modified sleeper stretch with strengthening exercise to reduced pain of shoulder joint among Badminton players. The experimental group reduced pain significantly from pre-test to post-test as compared to control group within six weeks.

Also, this study only looked at males between the 14 -18 years of age. It could also be of interest to examine other age groups within a different regional setting to determine if the treatment protocols will produce a significant change in Badminton players.

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