

## ORIGINAL RESEARCH

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## STUDY TO COMPARE THE EFFECTIVENESS OF STATIC STRETCH AND HOLD RELAX TECHNIQUE OVER HAMSTRING FLEXIBILITY

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## ABSTRACT

**Back ground:** Numerous studies have documented on flexibility of muscles. Flexibility is defined as the ability of the muscles to lengthen allowing one joint or more than one joint in a series to move through a range of motion .Flexibility allows tissue to accommodate more easily to stress thus minimizing or preventing muscle injury. But this study sought to identify the study to compare the effectiveness of Static stretch and Hold relax technique over the hamstring flexibility.

**Methods:** 30 healthy male adults with Hamstring tightness aged 21 to 35 years selected from general population through simple randomized technique. Samples are divided into two groups, static stretch Group-I(no.15) and Group-II Hold relax (no. = 15).The outcome was measured with help of sit & reach test to see the Hamstring flexibility .

**Results:** Comparison of the post test values of the group I and group II shows a significant difference between the outcomes of two groups with a “t” calculated value of 0.738 (unpaired “t” test)

**Conclusion:** Both static stretch and hold relax Technique can cause very highly significant result in Hamstring Flexibility, further comparison shows very high significant difference between two groups and concludes that hold relax is better than static stretch in Hamstring Flexibility.

**Key words:** Sit and Reach Test, Hamstring, Flexibility, Hold Relax and static stretch.

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## INTRODUCTION

Flexibility is characterized by the ability of a muscle to relax and yield to a stretch force Basmajian & Wolf 1990 also by range of motion available in a joint or group of joint.<sup>1</sup> It is also defined as the ability to move a single joint or series of joint smoothly & easily through an unrestricted pain free ROM.<sup>2</sup> Flexibility refers to the range of motion that you can achieve at any joint through any particular movement.

Flexibility is joint specific you may be flexible, in some joints and not very flexible in others. Flexibility allows tissue to accommodate more easily to stress thus minimizing or preventing muscle injury (Zachazewski). Flexibility mainly depends upon muscle length in conjunction with joint integrity & the extensibility of periarticular soft tissue. The extensibility of musculotendinous unit that cross a joint is based on their ability to relax & yield to a stretch force.<sup>2</sup>

Flexibility can enhance performance in some activities and it may even help reduce the risk of injuries. The importance of flexibility in performance is that they are able to produce force (that they can use their strength) throughout necessary working range of motion. Role of flexibility can play in physical performance its role in preventing musculoskeletal injuries. Flexibility is an important aspect of fitness it enhances performances and enjoyment of many activities and it may contribute to reduce risk of injuries. Flexibility related to body type (structure of joint) age, gender, genetic predisposition & physical activity.

Flexibility can be enhanced by proper stretching exercise stretching is describe as an any therapeutic maneuver designed to lengthen or elongate pathological shortened soft tissues structures and there by increased ROM.<sup>2</sup>

Stretching will increase the range of motion in the joint and develop greater muscle flexibility. It also increase the length of both your muscles & tendons this leads to an increase ROM which means your limbs and joints can move further before any injury occurs stretching is a vital part of any exercise program and should be looked upon as being as important as any other part of your health and fitness.

Stretching is a simple and effective activity which will help you to enhance your athletic performance decrease your likelihood of sports injury and decreasing muscle soreness. Various method of stretching in practice are static stretching, ballistic stretching & PNF.<sup>3</sup> Static stretching involves

stretching either actively (with no assistance or passively with assistance) holding stretch from 30 to 60 sec. Static stretching is performed by placing the body into a position where by the muscle or group of muscle to be stretched is under tension at this point the position is held or maintain to allow the muscle & tendon to lengthen. Static stretching is a measure of total ROM of the joint.

Hold relax is defined as resisted isometric contraction of the antagonist muscle (shortened) followed by relaxation it also increase passive ROM and decrease pain.

Jackson & Langford (1989) examined the validity of the standard sit and reach test as a field test for Hamstring & low back flexibility in adult women & men ages 20 – 45 years. They reported that sit and reach test had a excellent criterion related validity as test of Hamstring flexibility but was only moderately related to low back flexibility in men or women, sit and reach test had moderate criterion related validity as test of Hamstring flexibility, but was poorly related to low back flexibility. Minkler & I atterson (1994) reported that the modified sit & reach test was only moderately related to criterion measure of Hamstring flexibility for women and men poorly related to low back flexibility of women and men. In the past physical therapist, promoted stretching as a way to enhance flexibility thereby reduces the risk of Injury and improves performance. Two potential mechanisms are often proposed for the benefit of stretching a direct decrease in muscle stiffness via changes in passive viscoelastic properties, at an indirect decrease in muscle stiffness via reflex muscle inhibition and consequent changes in viscoelastic properties due to decreases acting myosin cross bridges. These changes in muscle stiffness would allow for an increased range of the motion (ROM) around the joint ie (flexibility) which is believed to enhance performance.<sup>4</sup>

Despite these claims, new research has challenged some of these concepts. In the quest to improve performance in short distance running much investigation of the variables affecting performance and the protocols for testing such variables has been carried out. Outline discussed in this paper are static stretch and Hold relax which are essential in Hamstring flexibility. So the purpose of the study is to find out the effectiveness of static stretch and Hold Relax over Hamstring Flexibility.<sup>5</sup>

## MATERIALS AND METHOD

It deals with the type of Research approach, which includes settings of the study, the different variables used, population, sampling techniques and sample selection, the inclusion and Exclusion criteria, the

description of the tool, collection of data, procedure of data collection and plan for data Analysis which was used in the study.

**SOURCE OF DATA:**

The sources of data are collected from the Shridevi Educational Institutions, Tumkur, Ethical clearance was obtained from the head of the Institution and prior permission for the study was taken from the Institution.

**METHOD OF COLLECTION OF DATA:**

The study is a comparative and experimental and the subjects were divided into Group I and Group II using simple random sampling. Thirty healthy male subjects aged between 21 to 35 years were included in the study. Group I consists of 15 subjects who were given static stretch and group II consists of 15 subjects who were given hold relax technique. The duration of the study was 6 weeks. The purpose, method and procedure of the study were explained to the subject in a language understood by them and their prior written consent was obtained. Inclusion criteria: healthy males, age group between 21 to 35 years, hamstring tightness, non-Yogic, non-sports person, 90° to 90° (+ve) straight leg rising. Exclusion criteria: Any musculoskeletal disease, fractures of lower limb, previous injury to tendon, nerves or bone of the lower limb, low back ache, decreased muscle power and recent hamstring strain. The parameter used in the study was Sit and Reach Test.

Static stretch technique: 30 seconds stretch, 10 seconds rest, 4 sessions per day, 5 days per week for 6 weeks.

Hold relax technique: Passive stretch for 30 seconds, Isometric contraction for 15 seconds followed by relaxation for 10 seconds, 4 sessions per day.

**PROCEDURE:**

The 30 subjects are those who come under inclusion criteria, they are divided into two groups, group I and group II. All the subjects had attended the trail session two days before the actual test.

Both the groups (Group -I and Group -II) undergone pretest with the help of sit and reach test to find hamstring flexibility before training and recorded as pretest score. The determination of sit and reach test, where a yard stick is placed on top of a box and box is approximately 12 inches tall. The measurement point of the scale was placed at Tibial Tuberosity and it was common for both the groups.

Subjects were instructed to sit, long sitting on the floor with feet flat against the box and to bend body forward. Were the one hand on top of the other and asked to slowly slide the hands on top yard stick and

reach forward as far as of possible. During sliding of the upper limb on yard stick, lower limb should be in full extension. The distance reached on the yard stick by the subject was recorded and in which best of 3 tries was taken as final score. After recording pretest scores of both groups (Group-I and Group-II).

The group I had been trained with static stretch (passive stretch),duration of the stretch was 30 sec, and 10 sec rest, for 4 sessions in a day and 5 days in a week and it was continued for 6 weeks in the physiotherapy department.

The group- II had been trained withhold relax technique passive stretch 30 seconds, isometric contraction 15 seconds relax 10 seconds for 4 sessions in day and 5 days in a week and it was continued for 6 weeks in the physiotherapy department. After 6 weeks of training period, the both groups undergone post test with help of sit and reach test, the distance reached on the yard stick by the subjects was recorded and in which best 3 tries was taken as final score and the results was tabulated to conclude the outcome of the study.

**DATA ANALYSIS**

It deals with statistical analysis and interpretation of the findings. The data was collected from 30 subjects. The collected data was tabulated and analyzed using descriptive and inferential statistical method the finding was summarized in the following sections

**Table-1:** MEAN AND STANDARD DEVIATION OF STATIC STRETCH

GROUP	PRE TEST		POST TEST	
	MEAN	SD	MEAN	SD
GROUP 1	15.27	2.68	17.57	3.83

**Interpretations of the result-**The group 1 of static stretch of pre test of 15.27 ± 2.68 and post test of 17.57 ± 3.83 has been observed. There is statistically significant difference at p<0.05

**Table-2** MEAN AND STANDARD DEVIATION OF HOLD RELAX

GROUP	PRETEST		POST TEST	
	MEAN	SD	MEAN	SD
GROUP II	16.50	2.20	18.43	3.95

**Interpretations of the result-**The group 1 of hold relax of pre test of 16.50 ± 2.20 and post test of 18.43 ± 3.95 has been observed. There is statistically significant difference at p<0.05

**Table-3** MEAN AND STANDARD DEVIATION OF GROUP I & GROUP II

GROUP	POST TEST	
	MEAN	SD
GROUP I	17.57	3.83
GROUP II	18.43	3.95

**Interpretations of the result**-The group 1 of  $17.57 \pm 3.83$  and group 2 of  $18.43 \pm 3.95$  has been observed. There is statistically significant difference at  $p \leq 0.05$

**Table: 4** PAIRED t-TESTS for comparing both groups

GROUPS	DISTANCE (IN INCHES)	
	't'-cal	't'-tab
GROUP I	4.219	1.761
GROUP II	6.710	1.761

**Interpretations of the result** -since 't'cal value is greater than 't'table value there is significant improvement between group 1 and group 2

**Table-5** INDEPENDENT "t" TEST FOR COMPARING BOTH GROUPS

VARIABLES	"t"Cal	"t"Tab
DISTANCE	0.738	1.761

\*"t" Table value 1.761 at 5% level of significance there is significance difference between for post treatment values of Group I and Group II.

## RESULT

According to the table, it was observed that there is a significant difference between the pre - test and post test value with 't' value of 4.219 using paired 't' test in group I (Static Stretch).

It is also note that a comparison of pre test and post test values of group II (Hold Relax) also shows significant with 't' value of 6.710 (paired 't' test).

Further comparison of the post test values of the group I and group II show a significant difference between the outcome of two groups with 't' cal value of 0.738. (Independent's' test).

## DISCUSSION

The study investigated the effect of 6 weeks flexibility enhancement programme by giving static stretching and hold relax on hamstring flexibility. result shows a significant improvement in both the groups while comparing between the two groups, the hold relax has shown better result than static stretching the improvement in flexibility that triggers increased range of motion, power generation. an analysis with unpaired t-test for the post test shows a 'p' value of 0.001 that is very highly significant.

## CONCLUSION

From the results obtained it is concluded that there is very highly significant enhancement in hamstring flexibility following both static stretch and hold relax technique in hamstring muscle.

Further comparison the post treatment effect of both static stretch and hold relax concludes that hold relax is better.

However, it is commented that with their small sample size it is difficult to standardize the result. Hence further study on larger samples over longer duration is recommended.

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