International Journal of Physical Education and Sports
www.phyedusports.in
Volume: 3, Issue: 04, Pages: 56-61, Year: 2018
Impact Factor: 3.125 (RIF)

Effect of Active Stretching Versus Passive Stretching to Increase Hamstring Muscle Flexibility in House Wives

Girish Baldha[1], R. Arunachalam[2], Parth Trivedi[3]

[1] Phd Scholar, Department of Physiotherapy, Madhav University, Aburoad, Rajasthan, India.

[2] Professor, Department of Physiotherapy, Madhav University, Abu Road, Rajasthan, India.

[3] Lecturer, C.M. Patel College of Physiotherapy, Gandhinagar, Gujarat & Ph.D. Scholar, Department of Physiotherapy, Madhav University, Abu Road, Rajasthan, India.

Received Mar 30, 2018; Accepted Apr 12, 2018; Published Apr 12, 2018

Abstract

Background: In women, body hamstring is more vulnerable muscle to be tight. There are many factors and reasons for reduced joint ROM one of which is muscular tightness. Tightness of hamstring muscle leads to loss of hip ROM and increase the risk of injury. There for the study is to find the effect of active versus passive stretching to increase hamstring muscle flexibility in house wives.

Methodology: Study design: Cross sectional study Inclusion criteria: housewives age of 30 to 50 years. Exclusion criteria: History of hospitalization in last one year Sample size: 30 house wives Sampling: Convenient sampling Study Setting: Stuti physiotherapy clinic, Ahmedabad. Procedure: Subject will be analysed by pre assessment of SLR (hip and knee 90˚-90˚) ROM and sit and reach flexibility test. All the subjects will treat under active and passive stretching of hamstring. Then pre and post assessment were analysed by SLR (hip and knee 90˚-90˚) ROM and sit and reach flexibility test.

Conclusion: There is improvement in hamstring muscle flexibility within an active and passive stretching. But there is no significant difference in improvement of hamstring muscle flexibility between active and passive stretching.

Key words: Stretching, hamstring, house wives, flexibility, Sit and reach test.

1. Introduction:

Therapeutic exercise in which individual muscle or tendon (or muscle group) is stretched with main aim of improving muscle elasticity and achieving comfortable muscle tone is defined as stretching. The result is a feeling of increased muscle control, flexibility and range of motion. Stretching is also used therapeutically to alleviate cramps. Stretching can be dangerous when performed incorrectly. Therapeutically there are various stretching techniques but depending on which muscle group is being stretched but one should be very much caution in selecting the stretching as it can cause muscle tear, hyper mobility, instability or permanent damage to the tendons, ligaments and muscle fibre. Stretches are either dynamic (meaning they involve motion) or static (meaning they involve no motion). Dynamic stretches are meant to increase dynamic flexibility and static stretches affect static flexibility. The different types of stretching are Dynamic, Active, Passive, Ballistic, Static, Isometric, PNF Active stretching is also referred to as static-active stretching. An active stretch is one where one assumes a position and then holds it without assistance other than using the strength of your agonist muscle. For example, bringing one's leg up high and then holding it there without anything to keep the leg in that extended position. The tension in the agonists in an active stretch helps to relax the muscles being stretched (the antagonists) through reciprocal inhibition Passive stretching is also referred to as relaxed stretching, and as static-passive stretching. A passive stretch is one where you assume a position and hold it with some other part of your body, or with the assistance of a partner or some other apparatus. For example, bringing your leg up high and then holding it there with your hand. Hamstring is more vulnerable muscle to be tight which reduces functional ROM which is associated with joint integrity as well as the flexibility, which are necessary for unrestricted, pain-free movements of the body during functional tasks of daily living. There are several factors and reasons responsible reduced joint ROM among them one of which is muscular tightness. Increase in tension from active or passive mechanisms is termed as muscle tightness. Passively muscle can become shorten through postural adaptation or scarring; actively, muscles can become shorter due to spasm or contraction. Regardless of the cause, tightness limits range of motion and may create a muscle

imbalance. Stretching is a general term used to describe any therapeutic maneuver designed to increase the extensibility of soft tissues which improves flexibility and ROM by elongating structures that are shortened and have become hypo mobile with due course of time. It is ability to move a single joint or series of joints smoothly and easily through an unrestricted and pain free ROM. Thus the aim of the study was to compare the effectiveness of active and passive stretching to increase hamstring muscle flexibility in house wives.

Indication

- Restricted ROM.
- Muscle weakness and shortening of opposing tissue have led to limited ROM.
- Component of a total fitness or sport-specific conditioning program designed to prevent or reduce the risk of musculoskeletal injuries.
- Prior to and after vigorous exercise to potentially reduce post exercise muscle soreness.

Contraindications

- A bony block limits joint motion.
- Recent fracture
- Acute inflammatory or infectious process, or soft tissue healing could be disrupted in the restricted tissues and surrounding region.
- Sharp, acute pain with joint movement or muscle elongation.
- Hematoma
- Hyper mobility

2. Review of Literature:

Divan mohaideen abbas, Bilques sultana (2014) had conducted a research to find out existing difference between active and passive stretching techniques efficacy of active stretching in improving the hamstring flexibility in professional football players. Result was when comparing the post and pre test results of both group there is significance in the results $p<0.002$ and there is no significant difference in the improvement in the range of motion.

Patchava Apparao, A. chaturvedi Pilladi (2013) had conducted a research to compare the effect of Static stretch and warm up exercise versus static stretch on hamstring tightness among student population of 18-22 years there were 30 students participated. Result show that clinically warm up and static stretching more effective but statistically this group is not significant may be because of small sample size.

Ayala F et al. (2012) compared the effect of active stretching in male with normal and limited hamstring flexibility. Result was both groups show improvements in HF-PROM.

Paul W. M. Marshall, Anthony cashman, et al. (2011) conducted a research to know effect of passive stretching on measures of hamstring extensibility, stiffness and stretch tolerance following 4 week passive stretching program. Result was passive stretching increases hamstring extensibility and decreases stiffness, with no change in stretch tolerance defined by pain intensity during the stretching.

Meroni, Roberto PT, cerri et al. (2010) compare an active and passive stretching technique to determine which one would produce and maintain the greatest gain in hamstring flexibility. Result was Active stretching produced the greater gain in AKER (active knee extension range of motion) test and gain was maintained 4 week after the end of the training.

Odunaiya N.A. et al (2005) conducted a study to determine the effect of static stretch duration on flexibility of hamstring muscle in it sample of 60 subject were taken and concluded that statically stretching tight hamstring for any duration between 15-120 second would significantly increase the flexibility.

Russell T. Nelson and William D. Bandy (2004) study that static stretching improves hamstring flexibility in 69 subjects, with mean age 16.45 years and limited hamstring flexibility were taken as subject. They observed improvement in hamstring muscle flexibility after static stretching.

Chung PK , Yuen CK (1999) conducted a study to examine the criterion validity of traditional, modified, and YMCA sit and reach test in 52 university men of mean age 20.7 year. Result was traditional and modified sit- and-reach tests are valid in assessing hamstring flexibility only, whereas the YMCA sit-and-reach test is valid for measuring both the hamstring and low- back flexibility.

3. Methodology:

Study Design: Cross sectional experimental study
Study Setting: Stuti physiotherapy clinic, Ahmedabad
Sampling Technique: Convenient sampling
Study Population: 30
Study Sample: House wives residing in Ahmedabad
Study Duration: 15 days

3.1 Criteria for Selection:

1. INCLUSION CRITERIA
House wives age between 30 to 50 years

2. EXCLUSION CRITERIA
History of hospitalization in last 1year History of injury.

3.2 Method:

In this study 30 individual house wives were included as per the inclusion and exclusion criteria. First all subjects were given consent form to fill up. Then explanation of whole technique was given to all. One group of 15 house wives were treated with active stretching. Subjects who were included in active stretching group were taught the technique. Another group of 15 house wives were treated with passive stretching with 30 second hold and 3 repetitions. Then both groups were analyzed for pre and post data of SLR (hip and knee 90˚-90˚) ROM and sit and reach flexibility test.

- **SLR (hip and knee 90˚- 90˚) ROM:-**

Procedure:

For SLR ROM hip and knee were kept at 90˚- 90˚ with using low stool. Then subjects were asked to straighten the knee as they can by keeping hip at 90˚ against stool. Then ROM was measured for knee joint by placing fulcrum of goniometry at lateral epicondyle of femur keeping movable arm with leg and stable arm with shaft of femur.

- **Sit and Reach flexibility test:**

For sit and reach flexibility test subjects were asked to sit in long sitting with keeping two feet 12 inches apart with dorsiflexion. Then measure tape was placed between both legs as 15 inches (38 cm) mark came at heel. Then ask subject to come forward by keeping knee straight and placing palm of one hand over

dorsum of another hand. Measure distance by using middle finger as reference and repeat 3 times and record best performance.

4. Results of the Study:

Statistical analysis was done within and between group by paired and unpaired t-test respectively.

SLR (hip and knee 90°-90°) ROM difference value between active and passive stretching group

Left

ACTIVE AND PASSIVE LEFT ROM DIFFERENCE

DIFFERENCE	MEAN	SD	P VALUE	SIGNIFICANT DIFFERENCE
A.S LEFT	11.60	3.5	0.3846	No
P.S LEFT	12.93	3.6		

There is no significant difference in hamstring muscle flexibility between active and passive stretching

ACTIVE AND PASSIVE RIGHT ROM DIFFERENCE

DIFFERENCE	MEAN	SD	P VALUE	SIGNIFICANT DIFFERENCE
A.S LEFT	10.80	3.8	0.2784	No
P.S LEFT	12.20	3.05		

Difference of Pre and post data of YMCA sit and reach flexibility test between active and passive stretching group

SIT AND REACH FLEXIBILITY TEST DIFFERENCE

DIFFERENCE	MEAN	SD	P VALUE	SIGNIFICANT DIFFERENCE
A.S LEFT	4.18	2.10	1.00	No
P.S LEFT	5.16	2.45		

5. Discussion:

Therapeutic exercise in which individual muscle or tendon (or muscle group) is stretched with main aim of improving muscle elasticity and achieving comfortable muscle tone is defined as stretching. The result is a feeling of increased muscle control, flexibility, and range of motion. Stretching is also used therapeutically to alleviate cramps. Stretching can be dangerous when performed incorrectly.

To improve hamstring muscle flexibility various stretching techniques are used by the therapist. There are various studies shown that both the active and passive stretching improves the flexibility and relieves the muscle tightness. Focus of this study was relying on the comparison of active and passive stretching techniques in improving the flexibility of hamstring muscle in house wives. In this study pre and post data were taken by SLR (hip and knee 90°-90°) ROM and sit and reach flexibility test in order to compare the effect of active and passive stretching method in improving the flexibility of hamstring muscle. The samples were selected according to the inclusion criteria, samples were 30 house wives. Where 15 were given active stretching and 15 were given passive stretching with 30 sec. hold and 3 repetition. The study was cross sectional. In this study the pre and post data was analysed. Result was improvement in post data of SLR (hip and knee 90°-90°) ROM and sit and reach flexibility test ($p<0.05$) within an active and passive stretching group compare to pre data. Improvement in flexibility is result of decrease in muscular tension and increase in muscle length. Stretching of muscle will produce tension to other structures such as joint capsule and fascia. While difference between

an active and passive stretching group shows similar difference of pre and post data may be because of small sample size, there is no statically significant difference in improvement of SLR (hip and knee 90°-90°) ROM and sit and reach flexibility test between an active and passive stretching as p>0.05. Divan mohaideen abbas, Bilques sultana (2014) had conducted a research to find out existing difference between active and passive stretching techniques efficacy of active stretching in improving the hamstring flexibility in professional football players. They had taken 60 football players of age 18-30 years. 30 (group A) was given active stretching and 30 (group B) were given passive stretching with 30 second hold for 5 times per day. The post test measurement were taken after course of 6 weeks of stretching. Result was when comparing the post and pre test results of group A and group B there is significance in the results p<0.002.When looking up the ROM in the 6th week it is >0.05,so there is no significant difference in the improvement in the range of motion. Patchava Apparao, A. chaturvedi Pilladi (2013) had conducted a research to compare the effect of Static stretch and warm up exercise versus static stretch on hamstring tightness among student population of 18-22 years there were 30 students participated with limited hamstring length were assigned to two groups: 1) static stretch 2) static stretch and warm up. The static stretch group consisted of one repetition of static stretch per a day for 30 sec duration, 5 times a week for a 6 weeks. Stair climbing for 10 minutes is given as a warm up before the stretching in group. Hamstring length was measure pre intervention and post intervention using active knee extension test. Data were analyzed using a student paired t-test and chi square test to find out difference between the groups. Result show that clinically warm up and static stretching more effective but statistically this group is not significant may be because of small sample size

6. Conclusion:

Thirty normal individual house wives between ages of 30 to 50 years had participated in study. There is improvement in hamstring muscle flexibility within an active and passive stretching. But there is no significant difference in improvement of hamstring muscle flexibility between active and passive stretching.

7. Conclusion:

30 individual house wives were taken and 15 were given active stretching while 15 were given passive stretching of hamstring muscle .The pre and post data for both group was analysed by SLR (hip and knee 90°-90°) ROM and sit and reach flexibility test. Many people suffering with tight hamstring and it can also lead to postural and back problems as they will tend to pull the pelvis from normal position. This study shows that hamstring flexibility increase with active and passive stretching, but there is no any significant difference in hamstring muscle flexibility between active and passive stretching.

8. References:

[1]. Carolyn Kisner,Lynn Allen Colby,Therapeutic Exercise foundation and techniques stretching for impaired mobility 6th edition p:76
[2]. https://people.bath.ac.uk/masrjb/Stretch/stretching_4.html
[3]. Phil page, Current concepts in muscle stretching for exercise and rehabilitation. International Journal of Sports Physical Therapy (IJSPT) 2012 February; 7(1): 109-119.
[4]. Hertling, D, and Kessler, RM: Introduction to manual therapy. In Hertling, D, Kessler, RM (eds): Management of common Musculoskeletal Disorders, ed.4 philapelphia: Lippincott Williams and Wilkins, 2006, pp 112-132.
[5]. Wilkinson, A: Stretching the Truth: A review of the literature on muscle stretching. Aust J Physiother 38:283-287, 1992.
[6]. Kendall, F: Muscles, Testing and Function: With Posture and Pain, ed.5. Philadelphia: Lipponcott Williams and Wilkins, 2005.
[7]. McClure, M: Exercise and training for spinal patients. Part B. Flexibility training. In Basmajianj, JV, Nyberg, R (eds): Rational Manual Therapies. Baltimore: Williams and Wilkins, 1993, p 359.
[8]. Divan Mohaideen Abbas, Efficacy of active stretching in improving the hamstring flexibility. International Journal of Physiotherapy and Research, Int J Physiother Res 2014, Vol 2(5):725-32

[9]. Patchava Apparao, A chaturvedi pilladi compare the effect of staticstretch and warm up exercise versus static stretch on hamstring tightness among students population. IJCRR, May 2013, 5(10): 120-127.
[10]. Ayala, F. Comparison of active stretching technique in male with normal and limited hamstring flexibility, Physical Therapy in Sport (2012) 1-7, doi:10.1016/j.ptsp.2012.03.013
[11]. Paul W.M. Marshall School of biomedical and Health Science, University of Western Sydney, Australia. November 2011, 14(6):535-540.
[12]. Meroni, Roberto PT; Cerri Comparison of active stretching technique and static stretching technique on hamstring flexibility Clinical journal of Sport Medicine, January 2010,20(1): 8-14.
[13]. Odunaiya N. A. African Journal of Biomedical Research, Vol. 8, No. 2, 2005, pp. 79-82
[14]. Russell T. Nelson J Athl Train. 2004 Jul-Sep; 39(3):254-258.
[15]. Chung PK, Yuen CK criterion related validity of sit-and-reach test in university men in Hong Kong. Percept Mot Skills, 1999 Feb; 88(1):304-16.

Corresponding Author:
Girish Baldha,
Phd Scholar,
Department of Physiotherapy,
Madhav University,
Aburoad, Rajasthan, India.