

SHORT TERM EFFECT OF AWARENESS THROUGH MOVEMENT VERSUS STATIC STRETCHING OVER HAMSTRING MUSCLE LENGTH

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Abstract : *Background :* Static stretching is a common technique used to improve muscle length and has been widely used in improving hamstring muscle length. Awareness Through Movement is an intervention developed by Moshé Feldenkrais and is shown to improve muscle length. Finding the best method to improve length of hamstring muscle is important for athletes and individuals to reduce the injuries associated with it. *Subjects:* 60 subjects were randomly assigned to awareness through movement and static stretching group. The subjects were selected by inclusion criteria and randomly divided equally in to two with 30 subjects in each group. *Method:* The static stretching group and awareness through movement group both underwent an exercise which was specific in improving hamstring length. The hamstring length was measured before and after treatment using active knee extension test. *Result:* In static stretching and awareness through movement group, pre-post statistical analysis found significant effect in increase of hamstring length with $p < 0.0001$, for right and left side. Comparative study between static stretching group and awareness through movement group found that static stretching exercise have significant effect in increase in hamstring length for right and left side with $p = 0.01$. *conclusion:* The results suggest that static stretching and awareness through movement both are effective in improving hamstring muscle length. However static stretching was more effective in improving hamstring length as compared to awareness through movement.

Key words: *Hamstring muscle, hamstring length, static stretching, awareness through movement*

I. INTRODUCTION

Hamstring muscles are an important group of posterior thigh muscles. They include semimembranosus, semitendinosus, and biceps femoris. The hamstring muscles are important contributors to control of human movement and involved in wide range of activities from running and jumping to forward bending during sitting or standing and a wide range of postural control actions. The length of the hamstring muscles is considered to play an important role in both the effectiveness and the efficiency of basic human movements, such as walking and running.¹

Reduced hamstring flexibility has been implicated in lumbar spine dysfunction and pain. A variety of methods are used to increase hamstring flexibility, they include: Static stretching, Proprioceptive neuromuscular facilitation, Dynamic stretching. None of these methods, however, uses a process of active motion without pushing or holding at end-range to achieve its intended results.^{3,4}

Awareness through movement (ATM) is an intervention developed by Moshé Feldenkrais. It is a process that facilitates learning of strategies for improving organization and coordination of body movements, by developing spatial and kinesthetic awareness of body segments relationship at rest and during motion, awareness of ease of movement, reducing effort in action and learning the feeling of longer muscles in action. Limited studies are available which state effectiveness of awareness through movement in hamstring length. The studies which are done have not compared awareness through movement to other lengthening techniques.⁶

PROBLEM STATEMENT

To study the effect of awareness through movement versus static stretching over hamstring length

OBJECTIVES

- 1) To find the effect of static stretching over hamstring length using active knee extension test
- 2) To find the effect of awareness through movement over hamstring length using active knee extension test
- 3) To compare the effects of awareness through movement and static stretching over hamstring length using active knee extension test

METHODOLOGY**Study design:** Comparative study**Study area:** Smt Kashibai Navale College of Physiotherapy**Study population:** Subjects with bilateral hamstring tightness**Sample size:** 60**Sampling method:** Purposive sampling**Study duration:** 6 months**Selection criteria****Inclusion criteria:**

1. Age :18-25 years
2. Subjects with bilateral hamstring tightness- defined by an incomplete knee extension in the active-knee-extension test, when the subject failed to straighten the knee to its full extension by 20°
3. Both genders

Exclusion criteria:

1. Any lower limb musculoskeletal disorder or surgery
2. Back and lower limb injury
3. Neurological dysfunction
4. Subjects involved in any other stretching exercises or sports

Measuring tools:

1. Universal goniometer
2. Examination table,
3. Straps

PROCEDURE

Written consent was taken from subject who fulfill the inclusion criteria and who volunteered to participate in the study. Subjects demographic data age, gender was recorded..Subjects who met the inclusion criteria were assigned into two groups based on simple random sampling. A pretreatment active knee extension test was performed to evaluate the tightness of hamstring. The subjects were assigned into two groups:

Group A(n=30): That received static stretching exercise

Group B(n=30): That received ATM intervention

The subjects were refrained from beginning any new physical activity, including hamstring muscle stretching that had not been part of their regular activity prior to the 3-week period of the intervention

GROUP A

Static stretching was performed.

Standing Hamstring Stretch:

Standing with the leg to be stretched just in front of the other one. Then the subject was asked to lean forwards from the hips until a hamstring stretch was perceive

The subjects were asked to place the hands on the front leg's thigh. The stretch was held for 15 seconds.

GROUP B

Standing Lesson: The subjects were asked to perform the following exercise:

Standing with feet a comfortable distance apart. Flex at the hips and knees and bend forward reaching the hands to touch somewhere comfortably below the knees or distal to ankle as per the comfort. From this starting position, the subjects were asked to learn the coordination of combining knee extension, hip medial rotation, and anterior pelvic tilting and of combining knee flexion, hip lateral rotation, and posterior pelvic tilting. The subjects were asked to slide the hands farther down the legs with the knee extension component of the movement.

FOR BOTH THE GROUPS:

Number of repetitions

1st week-5 repetitions

2nd week-7 repetitions

3rd week-10 repetitions

Exercise was performed 5 times a week for 3 week

OUTCOME MEASURES

Active Knee Extension Test

STATISTICAL ANALYSIS

Statistical analysis was done using Primer software with level of significance $p < 0.05$

The paired and unpaired t-test was done to analyze the results

IV. RESULTS AND DISCUSSION**4.1 Results of Descriptive Statics of Study Variables**

Table 4.1: RIGHT LOWER LIMB: Pre and post value comparison between static stretching and awareness through movement(ATM)

Right limb(AKE)	Pre (degrees)	Post (degrees)	p-value
Static stretching	40.93	79.5	0.001
ATM	42.2	73.4	0.001

Table 4.1: The p value=0.00 which suggests that there is good statistical significance between the pre and post values of both the groups

Table 4.2: LEFT LOWER LIMB: Pre and post value comparison between static stretching and awareness through movement(ATM)

Left limb(AKE)	Pre (degrees)	Post (degrees)	p-value
Static stretching	41.27	79.83	0.001
ATM	41.63	74.27	0.001

Table 4.2: The p value=0.00 which suggests that there is good statistical significance between the pre and post values of both the groups

DISCUSSION

In this study,60 samples of both the genders, in the age group of 18 to 25 years were included.A pretreatment active knee extension test was performed to evaluate the tightness of hamstring and the subjects were assigned into two groups :

Group A(n=30): Received static stretching exercise, Group B(n=30): Received ATM intervention

The results indicate that static stretching and awareness through movement both are effective in improving the hamstring muscle length. There was significant difference in length of hamstring muscle in static stretching group as compared to awareness through movement after the intervention.

Static stretching is a common technique used to increase muscle length. This type of stretching takes muscle to its end range and maintains the position. Advantage of static stretching maybe the facilitation of Golgi tendon organ which produces autogenic inhibition of the muscle which is stretched. The range of motion improvement in static stretching may be attributed to an increase in the stretch tolerance found in static stretching. These improvements maybe attributable to the visco-elastic changes that occur with creep where by tension in the muscle tendon unit diminishes over time.

Awareness through movement is a process of guiding a person through an activity during which movements usually are performed slowly and gently.

The ultimate goal is to retrain brain to perform simple movements that are physiologically effective and comfortable. The exercises are slow, gentle and adjustable. Their calming effects counters the stress that results in contracted muscle, tightness and pain. The principles of awareness through movement assume that physical restrictions are due to habitual poor use. Bodies become locked into habitual movement patterns, muscle tension is preserved and consequently movements require more effort become less differentiated and cause muscle spasm, tightness and stiffness. Through awareness through movement, intricate dissociations of movements can be practiced, learned and the cause of dysfunction can be resolved. All of these factors could attribute to the increased length in hamstring muscles via awareness through movement.

CONCLUSION

The study concludes that both static stretching and awareness through movement are effective in improving hamstring muscle length, however static stretching was more effective in improving hamstring length as compared to awareness through movement.

LIMITATIONS

The sample size for the study was limited. The long term effect of the intervention was not measured

FUTURE SCOPE

The effect of awareness through movement on different parameters like balance, flexibility, pain in various muscle groups and in various conditions can be studied

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