



PREVALANCE OF HAMSTRING TIGHTNESS DUE TO PROLONG SITTING AMONG HEALTHY PHYSIOTHERAPY STUDENTS : CROSS SECTIONAL STUDY

Physiotherapy

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ABSTRACT

Background : Flexibility is defined as the ability of a muscle to lengthen and allow one joint (or more than one joint in a series) to move through a range of motion. The prolonged sitting hours can alter the flexibility of soft tissues, especially two joint muscles. In prolonged sitting, a constantly shortened position develops hamstring trigger points and causes muscle tightness. **Materials And Methods :** 62 students were included into the present study who are involved in prolong sitting for minimum 8-10 hours. Active knee extension test was used to measure the popliteal angle in both lower extremity using universal goniometer. Statistical analysis done by using SPSS software. **Result :** Analysis shows that the right lower extremity is more tight than left with the mean difference of 27.79 and 23.23 respectively in male subjects. and 25.51 and 13.16 respectively in female subjects. **Conclusion :** Present study concludes that there is high prevalence of hamstring tightness in college going students with prolong sitting duration.

KEYWORDS

hamstring tightness, prolong sitting, active knee extension test,

INTRODUCTION :

Flexibility is defined as the ability of a muscle to lengthen and allow one joint (or more than one joint in a series) to move through a range of motion. It is a physical fitness attribute and is often evaluated from the joint range of motion, an essential element of normal biomechanical functioning in sports and daily living activity.³

Hamstring consist group of three muscles, semitendinosus, semi membranous and biceps femoris, which makes up the posterior compartment of the thigh. They are the major knee flexors and also helps in hip extension.³

For proper biomechanical functioning in sports and daily activities, flexibility is crucial. Muscle tightness will make it impossible for the person to accomplish tasks that require pain-free range of motion. Neuro-musculoskeletal problems are brought on by a lack of flexibility. These musculoskeletal symptoms will lead to decrease in strength, stability, endurance.^{4,3}

As the hamstring muscle is attached to the ischial tuberosity, tightness in the hamstrings leads to the posterior rotation of the pelvis during standing. The posterior pelvic tilt, which results from hamstring tightness, lowers lumbar lordosis and produces low back pain. The normal lumbo-pelvic rhythm is also impacted. College-bound individuals are observed to have a significant prevalence of hamstring tightness as they spent more time in sitting due to their work demand.^{2,3} The prolonged sitting hours can alter the flexibility of soft tissues, especially two joint muscles. In prolonged sitting, a constantly shortened position develops hamstring trigger points and causes muscle tightness.^{2,5}

The primary cause of muscle tightness is a decrease in the muscle's capacity to deform, which results in a smaller range of motion at the affected joint. Tight hamstrings are linked to a faulty motor control pattern that causes postural muscles to fire below their maximum potential, which causes the hamstrings to act more as stabilizers than as prime movers. Tightness in the hamstrings is the result of this shift in primary function.⁵

Hamstring tightness can develop for a variety of reasons, including genetic susceptibility, muscular damage, and adaptive shortening brought on by a chronic illness. One of the primary causes of the postural irregularities that are prevalent in contemporary society is the sedentary lifestyle of today. The majority of employment and educational settings need extended periods of sitting, which can reduce soft tissue flexibility, particularly in the two joint muscle.⁸

Aim :

To find the prevalence of hamstring tightness due to prolong sitting among healthy physiotherapy students.

Materials And Methodology :

Study Design – cross sectional study

Study Location – PDCOP, campus

Sample Size – 62

Calculated by open epi site

Inclusion Criteria :^{1,4}

- Both male and female genders
- 18 – 25 years of age group
- Subject with at least 15 degree loss of knee extension.
- Willing to participate

Exclusion Criteria :^{1,4}

- Any history of previous hamstring injury / surgery
- History of lower extremity fractures
- Low back pain since last 2 months
- Currently receiving any physiotherapy treatment
- History of neuromuscular diseases

MATERIALS :

- Couch / plinth
- Universal goniometer
- Pen / paper
- Consent form

Methodology :

This study was mainly done on college going students. Ethical clearance was taken from the institutes ethical committee. Informed consent was taken from the students and the procedure is first explained to them and assessed their hamstring length by active knee extension test. Subjects were assessed on a couch in supine position with both lower extremity extended and relaxed.

The subject lies supine on a plinth with their knee and hip flexed to 90 degree. Position of femur was maintained by using frame. Students were instructed to extend their right leg as far as possible; keeping their foot relaxed and hold the position for 5 seconds same procedure is performed for left leg. And at the end of the 5 second holding period the angle of knee extension was measured. Fulcrum of goniometer was positioned over the axis point previously marked on the lateral joint line.

Statistical Analysis And Result :

Table No. 1 Gender Wise Distribution Of Participants

Gender	Frequency	Percentage
Male	13	21%
Female	49	79%
Total	62	100%

Table 1- shows that study includes 79% of female subjects and 21% of

male subjects .

Table No. 2 Hamstring Tightness Difference In Males

	Right lower limb	Left lower limb
Mean	27.76923	23.2308
SD	25.38	21.46

Table 2 shows the mean hamstring tightness in male on right side is 27.79 and on left side is 23.23 , indicating that right side is more affected than left.

Table 3 – Hamstring Tightness Difference In Females

	Right lower limb	Left lower limb
Mean	25.51	13.16
SD	10.52	10.07

Table 3 shows the mean hamstring tightness in male on right side is 25.51 and on left side is 13.16 , indicating that right side is more affected than left.

Table 4- Severity Of Hamstring Tightness

Severity	Right	Left
0-15 degree	8	16
16-30 degree	22	17
31-45 degree	27	28
46-60 degree	05	01

Table 4 shows that severity of hamstring tightness is more in the angle between 31-45 degrees. RLE shows 87% prevalence of HMT.

Table 5- Distribution According To Sitting Hours .

Sitting duration	Popliteal angle (mean)		No. of subject
	RLE	LLE	
6-8 hours	36.25	32	8
8-10 hours	27.07	20.8	13
>10 hours	30.35	25.04	41
Total			62

Table 5 : shows that popliteal angle mean increases with increase in sitting duration and right lower extremity shows more tightness score than left with the mean of 36.25 , 27.07, 30.35 (6-8 hrs , 8-10 hrs , >10 hrs respectively.

DISCUSSION :

Present study was conducted to find out the prevalence of hamstring tightness in healthy college going students. Flexibility dysfunction is a widespread problem faced not only by sportsperson but also common person especially in case of hamstring group of muscles. Hamstring tightness is not only a causative factor for reduced range of motion but it can also lead to various other musculoskeletal problems. Length-tension relationship of muscle as well as shock absorbing ability of the limb is affected by tightness of muscle. Hamstring tightness creates a vicious circle of range reduction and results into increase in postural problems.²

In present study total 62 subjects both male and female were included .Hamstring tightness on both the lower extremity was measured by using active knee extension test .

Present study shows that the right lower extremity is more tight than left with the mean difference of 27.79 and 23.23 respectively in male subjects . and 25.51 and 13.16 respectively in female subjects . with hamstring tightness prevalence of 87% as mentioned in table no. 4.

Bhagyashree k. Koli et. al concluded that ,The prevalence of hamstring tightness is very high in college going student of age group 18-25.¹

R. Gowtham et. al , in their study states that there is an equal prevalence of developing hamstring tightness in both males and females of the young population. The limitation of the study with an equal number of males and females.⁹

Present study in table 5 shows that high mean popliteal angle is found among the students with maximum sitting duration and right lower extremity is affected more than left lower extremity with values of 30.35 and 25.04 respectively .

Fatima G, Qamar MM, Ul Hassan J, Basharat A. Extended sitting can cause hamstring tightness. Saudi J Sports Med 2017;17:110-4.

Conducted the study on 200 college going students and Found that prolong sitting can be a contributory factor in hamstring sitting . according to the results of there study, a decrease in the range of hamstrings was seen with increase in the number of sitting hours (P = 0.007), and overall reduction in flexibility of the hip and pelvis was seen with increase in sitting hours (P= 0.002).²

jabbar, mehreen et al in their study, Prevalence Of Hamstring Tightness Due To Prolonged Sitting Among Administrative Staff, found that here is 55.5% prevalence of HMS tightness due to prolonged sitting among administration staff. ⁴

The important finding was an alarming high rate of hamstring tightness among most of students with maximum duration of sitting. Which shows the need to incorporate a fitness program /stretching in various sectors that involve prolong sitting. Hamstring flexibility is important to maintain the balance in length tension relationship of muscle and in turn avoid the other musculoskeletal impairments.

CONCLUSION :

Looking at statistical analysis and results our study concludes that there is high prevalence of hamstring tightness in college going students with prolong sitting duration .

Limitation :

- Students are not equally distributed according to gender .
- Small sample size

Future Scope :

Future study needs to be done to evaluate gender influence on hamstring tightness.

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Interest Of Conflict : There are no conflict of interest.

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