

## PREVALENCE AND SEVERITY OF HAMSTRING TIGHTNESS AMONG COLLEGE STUDENT: A CROSS SECTIONAL STUDY

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### ABSTRACT

**Background:** Flexibility is important for normal biomechanical function. Muscle tightness is caused by a decrease in the ability of the muscle to deform. Hamstring tightness leads to high risk of recurrent injury, decreases the performance in athletes, lead to post-exercise soreness and decreases coordination among athletes. Hence, the objectives of this study was to find out the prevalence and severity of the hamstring tightness among college going student. **Method:** In this cross sectional study 50 participants with hamstring tightness were included using purposive sampling. The tightness was measured by AKE test. Three measurement were taken and average of their reading was noted. **Result:** Analysis showed higher prevalence of hamstring tightness among college students. More students were affected with AKE angle between 30°-45°. **Conclusion:** Prevalence of hamstring tightness is very high in college going student of age group 18-25 years.

**KEYWORDS:** Prevalence; Active knee extension test; Hamstring Tightness severity.

### INTRODUCTION

Flexibility is considered an essential element of normal biomechanical function. Hamstring tightness leads to high risk of recurrent injury, decreases the performance in athletes, lead to post-exercise soreness and decreases coordination among athletes [1]. There is higher percentage of prevalence of hamstring tightness in right lower extremity [2]. The hamstring muscles are commonly linked with movement dysfunction at the lumbar spine, pelvis and lower limbs, and have been coupled with low back pain and gait abnormality [3]. Limited flexibility causes neuro-musculoskeletal symptoms. These musculoskeletal symptoms will lead to decrease in strength, stability, endurance and much more. All these things will lead to recurrent injury and might affect psychosocial aspect of the athlete [3].

Decreased hamstring flexibility is a risk factor for the development of patella tendinopathy and patellofemoral pain hamstring injury and symptoms of muscle damage following eccentric exercise [1]. Hamstring tightness are associated with a posterior rotation of the

pelvis in standing due to attachment of hamstring muscle is on ischial tuberosity. Tightness in hamstring muscle causes posterior pelvic tilt which lead to decrease in lumbar lordosis result in low back pain [4]. This study was undertaken as there is lack of literature on prevalence and severity of hamstring tightness among college going student. Hence purpose of the study was to find hamstring tightness among college going student.

### MATERIAL AND METHODOLOGY

**Study design:** This cross sectional study descriptive study

**Ethics approval:** Study was approved by IEC of our Institute and written informed consent were taken from all subjects. Detailed procedure was explained to participants

**Study location:** Which was conducted at DVVPF's College of Physiotherapy

**Sample size:** which includes 50 college going students

**Inclusion criteria:** Sample within the age group of 18 to 25 years, with a mean age of 21 years, volunteered to participate in this study. Subjects with at least 15° loss of knee extension, when hip held in 90° flexion were included in the study.



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**Exclusion criteria:** Subject with any past hamstring injury with in last 2 years, low back pain since past 2 months, lumbar and lower limb neurological compromise were excluded

**Methodology:** Active knee extension test is used to check hamstring tightness. Participants were assessed on a plinth in the supine position with both lower extremities extended. Both anterior superior iliac spines were positioned by aligning them with the vertical bars of the apparatus. The lower extremity not being measured was secured to the plinth using a strap across the lower third of the thigh. The participants were told to flex the hip until the thigh touched the horizontal bar While maintaining the contact between the thigh and horizontal bar, the participants were asked to extend the leg as much as possible while keeping their foot relaxed and to hold the position for about 5 seconds. A standard universal goniometer was placed over the previously marked joint axis, and the goniometer arms were aligned along the femur and fibula [5, 7].

The AKE measurement was defined as the degree of knee flexion from terminal knee extension. Each knee was measured thrice, and the mean angle of the AKE test was used for analysis. [5]



Fig 1. Starting position of AKE



Fig 2. End position of AKE

**RESULT**

In this study, there were total 50 participants out of which 2 were male and 48 were female whose anthropometric data was collected before assessing hamstring tightness. The mean of the anthropometric data is mentioned in table 1.

**Table 1. Anthropometric data**

Anthropometric data	Age (Years)	BMI (kg/cm <sup>2</sup> )
Male	23.5±6.36	23.9±3.39
Female	22.16 ±1.29	20.9 ±4.03

Data was presented as Mean ±SD

Using the height and weight, BMI was calculated. It was found that 38% of the participants had high value BMI and 24% of participant were underweight and 38% of the participants had BMI under normal range. The data is represented in figure 3

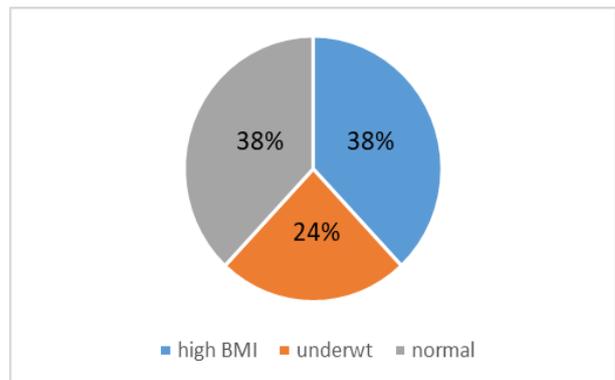


Fig 3. BMI distribution

Mean hamstring tightness in male when calculated side wise, it was found that right side is more affected than left. Graphical representation can be seen in figure 4

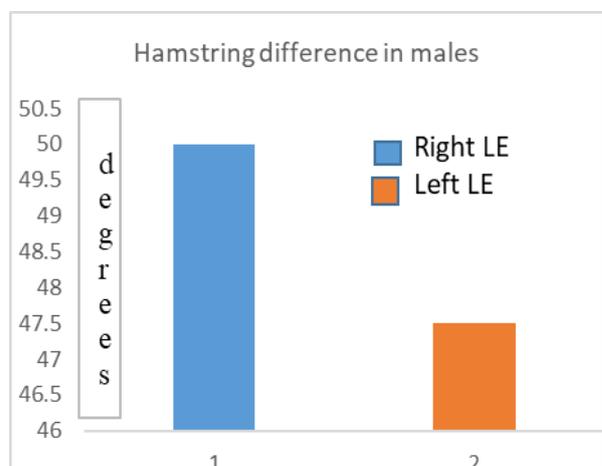
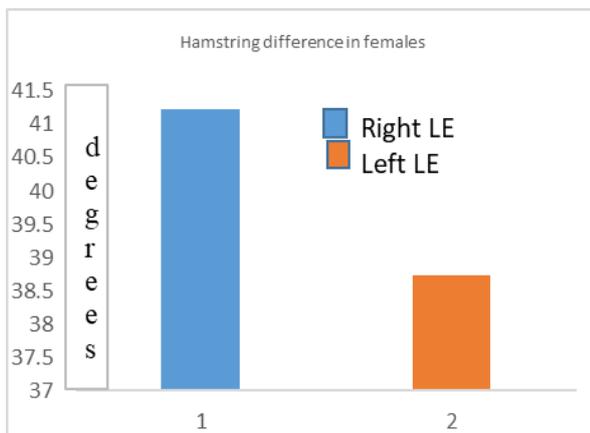


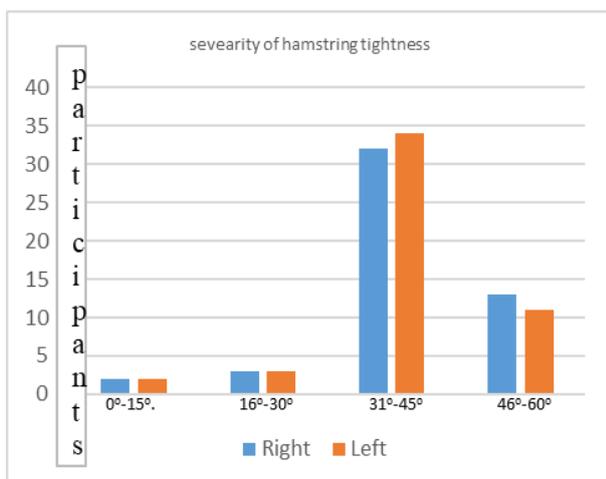
Fig 4. Hamstring tightness difference in males  
RLE: right lower extremity; LLE: Left lower extremity

Mean hamstring tightness in male when calculated side wise, it was found that right side is more affected than left. Graphical representation can be seen in figure 4



**Fig 5. Hamstring tightness difference in females**

Mean hamstring tightness in female when calculated side wise, it was found that right side is more affected than left. Graphical representation can be seen in figure 5



**Fig 6. Severity of hamstring tightness**

Severity of hamstring tightness was found higher in angle between 30°-45°. Graphical representation can be seen in figure 6

## DISCUSSION

Lack of literature on hamstring tightness in Indian population made us to think about this research. The objective is to find out the Prevalence and severity of hamstring tightness among college going student.

From our study over all prevalence tightness is higher, prevalence in male 4% and in female prevalence is 96% the large difference could be because of more female than males in our study.

Shanka weerasekara et al conducted study the preva-

lence of hamstring tightness among the male athletes of university of peradeniya in 2010, Srilanka prevalence of hamstring tightness was present at significantly higher rates among athletes who are engaged in contact sport among other measured category of sports in the study. Within the con nes of this study it was found that there is no significant association between hamstring tightness and body height, femoral length, duration of warm- up and cool-down periods. Therefore precautions to prevent hamstring tightness should be a major concern of the athletes who are playing contact sport [2].

Dipesh Thakur et al conducted a study to find out the correlation between the right and left hamstring length in both gender to determine the prevalence of hamstring tightness among college students. All subjects had hamstring tightness. The result of the study conclude that there was a significant correlation between the right and left hamstring muscle in both the group but there was no correlation of hamstring length when compared with right hamstring length between group and left hamstring length between group. Male subject had comparatively more tightness in left and in female had in right. The linear prevalence of hamstring tightness was greater in female subject when compared with male subject [4].

Sheetal Mahadik conducted a study prevalence of hamstring tightness in youngster 18-25 years age– a cross sectional study. In this study they conclude that prevalence of hamstring tightness in youngsters is 82% when assessed by using active knee extension test & prevalence of hamstring tightness is more in female than male [6].

Akinpelu conducted study on influence of age on hamstring tightness in apparently healthy Nigerian, subjects' mean age was 29.63 ± 16.72 years. All subjects had hamstring tightness (absolute extension lag) and this increased with age up to age group 40-49 years. The male subjects had significantly higher hamstring tightness than the females in all the age group [5].

National Academy of Sport Medicine said that mechanical tightness of constantly shortened or contracted state over the time muscle will adopt by becoming physically shortened and tighter.

Cinar suggested patella femoral pain syndrome due to lack of hamstring flexibility. Fitzgerald result edweak and unstable lower abdominals and spinal erectors result in hamstring tightness [8]

Eric Cressey June 12, 2012 concluded that anterior pelvic tilt puts a more pressure on hamstrings and this tilt result in hamstring tightness in individual [9].

Result analysis shows that severity of tightness in active

knee extension test between 31°- 45° 68% of peoples are affected. Hence majority of participants were affected with sever tightness of hamstring.

**Limitation of our study:** Participants was not distributed equally according to gender, participants were only from one occupation and activity level of participants not assessed. Hence we recommend that further study can done with inclusion of equal number of male and female with consideration of level of activity.

## CONCLUSION

The prevalence of hamstring tightness is very high in college going student of age group 18-25. Hence awareness of hamstring stretching is important to prevent musculoskeletal problem of lower quadrant.

**Conflict of interest:** Nil

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