

Predisposing Factors for Hamstring Tightness among University Students

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Abstract

Hamstring is the muscle which makes the posterior compartment of the thigh. It is the most common muscle which gets injured easily due to the tightness of the muscle. This study aimed to determine whether extended sitting, body composition, Hamstring to Quadriceps strength ratio (H/Q Ratio) and level of physical activity predispose to hamstring tightness. This study also focused on identifying the influence of gender and leg dominance on hamstring tightness.

Hamstring muscle tightness was significantly higher in males than that of females. Non-dominant leg (right or left) did not show a difference in tightness than the dominant side. The association between extended sitting and Hamstring tightness was significant while the association between Hamstring tightness with body composition, H/Q ratio and level of physical activity was not significant. It is important that we take measures to minimize the risk of developing hamstring tightness among university students.

Keywords: Hamstring tightness; Sitting hours; Gender; Leg dominance; Body composition

Introduction

Hamstring is a group of three muscles, semitendinosus, semimembranosus and biceps femoris, which makes up the posterior compartment of the thigh. It involves in Hip extension and knee flexion. Hamstring is the most common muscle which gets injured easily and main reason being the tightness of these muscles. Muscle tightness is caused by the decreased ability of the muscle to deform and results in a decreased range of motion at the joint on which it acts [1]. It is found that the prevalence of hamstring tightness among students is high [2].

Muscle length, hamstring strength, strength ratios, demographic characteristics, history of previous injury, lack of flexibility, muscular control and inadequate warm up are some common causes for hamstring strain [3]. Previous studies have focused on age [4], Gender [5], lifestyle [6], and BMI [7] as factors associated with hamstring tightness.

This study aimed to determine whether extended sitting, body composition, Hamstring to Quadriceps strength ratio (H/Q Ratio) and level of physical activity predispose to hamstring tightness. It was also expected to find out the association of Hamstring tightness with extended sitting, body composition, H/Q Ratio and level of physical activity. This study also focused on identifying the influence of gender and leg dominance on hamstring tightness.

Materials and Methods

This is a cross sectional descriptive study which was conducted to find out the Predisposing factors for hamstring tightness among the

students of Faculty of Allied Health Sciences, University of Peradeniya, Sri Lanka. According to the inclusion and exclusion criteria 100 students with the mean age of 24 (21-27 years), including both males and females, from the Faculty of Allied Health Sciences, University of Peradeniya, Sri Lanka were recruited for our study. Out of the 100 students there were 71 females and 29 males. The students were selected from all four academic years and from four departments of the faculty. The data collection was conducted at the physiology laboratory, Department of Physiology, Faculty of Medicine, University of Peradeniya.

This study was approved by the Ethical Review Committee of Faculty of Allied Health Sciences, University of Peradeniya. All Participants were recruited only after obtaining their consent.

Data were collected through Questionnaires and Measurements. First the written consent was obtained from the participants. Then the participants were asked to fill a self-administered questionnaire which was followed by taking measurements.

Each measurement was taken in separate stations by the examiners. Test for leg dominance and sit and reach test length were measured in the first station. Single leg hopping test was used to determine the dominant leg. Sit and reach length was measured with a standard sit and reach box. Popliteal angle was measured in the second station and a standard goniometer was used to measure it. In the third station Skin fold thickness was measured with Harpenden skinfold calliper. From the skinfold thickness measurements body composition was obtained using the standard formula. Hamstring and Quadriceps strength were measured in the fourth station with MicroFET 2 Hand held muscle dynamometer. Hamstring to Quadriceps strength ratio was obtained from hamstring and quadriceps strength measurements. SAS statistical package was used for statistical analysis.

Results and Discussion

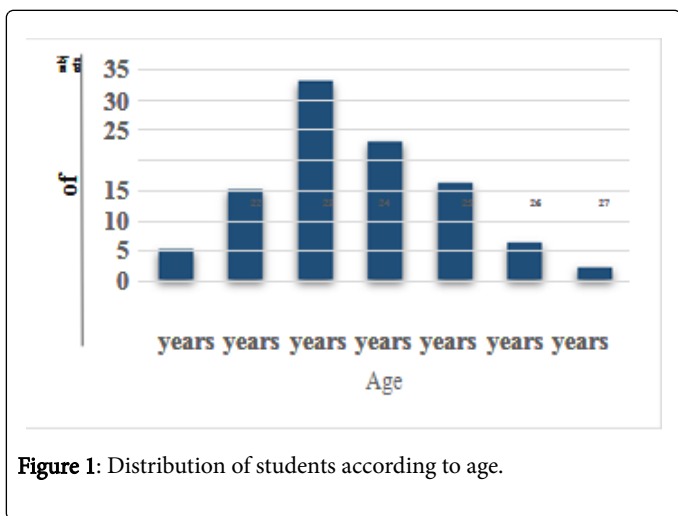


Figure 1: Distribution of students according to age.

Figure 1 shows the distribution of students according to their age. The mean age of the sample is 24 years.

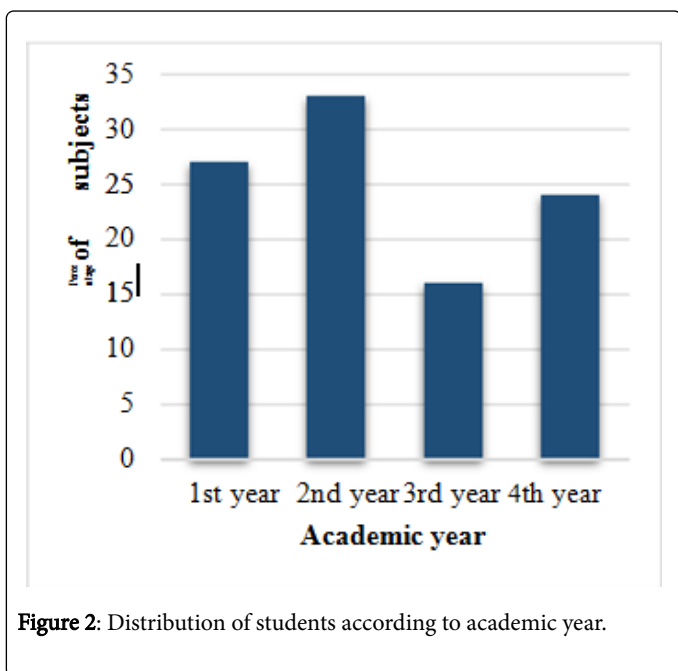


Figure 2: Distribution of students according to academic year.

Figure 2 shows the distribution of our sample according to their academic years. Majority (33%) of our samples were from the 2nd year while the least number (16%) of students participated from the 3rd year.

Figure 3 shows the percentage of both males and females according to their stage of hamstring tightness.

A test was done to find out the difference in hamstring tightness in males and females. It was revealed that hamstring muscle tightness was significantly higher in males ($p < 0.05$) than that of females. Another t-test was done to find the difference of hamstring tightness in the dominant and non-dominant leg. Non-dominant leg (right or left) did not show a difference in tightness than the dominant side ($p > 0.05$). The association between extended sitting and Hamstring tightness was significant ($p < 0.05$) while the association between Hamstring tightness

with body composition, H/Q ratio and level of physical activity was not significant ($p > 0.05$). Chi square tests were done to find out the above results. Hamstring tightness has a weak positive correlation with body composition and level of physical activity while it has a weak negative correlation with H/Q ratio.

These results should be taken into consideration to modify the lifestyle of university students to minimize hamstring tightness and thus preventing hamstring injuries. Further researches can be done on this topic to figure out the potential predisposing factors for hamstring tightness among university students.

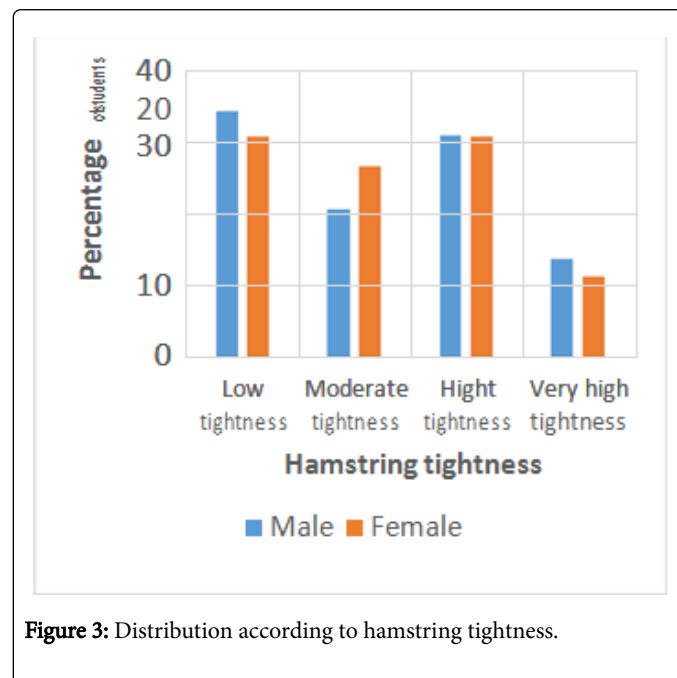


Figure 3: Distribution according to hamstring tightness.

Conclusion

Extended sitting is a major predisposing factor for Hamstring tightness. Modifications should be implemented in the lifestyle of students to minimize the extended sitting hours.

In future, studies have to be done to reveal the other major predisposing factors for hamstring tightness. This study can be expanded by including students from various disciplines other than students from the Faculty of Allied Health Sciences to produce generalized results.

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