

PREVALENCE OF HAMSTRING TIGHTNESS AMONG SCHOOL GOING STUDENTS AGED 13 TO 17 AND ASSOCIATION WITH SITTING HOURS

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Abstract

Aims: This study aimed to investigate the Hamstring (HMS) tightness and its clinical characteristics in school-going adolescents in the Multan region. Objectives: To measure the prevalence of HMS Tightness among secondary school students Aged 13 to 17 years and its association with prolonged sitting hours. *Methodology:* A cross-sectional observational study was conducted using a self-made questionnaire. Data of 370 adolescent students were taken from the secondary schools of Multan. The baseline data of the range of movement was measured by using a universal goniometer. Statistics & Results: Data was collected on a data sheet & encoded for computerized analysis using SPSS version 25 for Windows. The Convenient sampling technique was used 83.78% of students had a range of less than 80 degrees and were having hamstring tightness, while 16.22% of students had PSLR ROM 80 or more than 80 degrees. The PSLR test was applied on both legs, for the right leg it stated the ROM between 60 to 80 degrees with a mean 73.29 and a standard of 6.743. In the left leg, the PSLR test showed ROM of 59 to 80 degrees with a mean of 73.29 and a standard deviation of 6.763. To find the association between prolonged sitting hours and HMS tightnessChi-squaree was applied, and it showed that there was statistical significance (p=0.004). Conclusion: There was a high prevalence of Hamstring Tightness in students and has a significant association with prolonged sitting hours.

INTRODUCTION

In children and adolescents, according to various studies the adverse effects of inactivity are observed on the musculoskeletal system (Contardo Ayala et al., 2016). In school, adolescents adopt multiple sitting problems in accordance with the existing infrastructure and orthodox practicing system such as bench sitting and prolonged sitting hours, the pupils spend around 5.5 to 6.5 hours per day attaining the same sedentary posture with no sufficient activity to meet the needs of an active lifestyle (Deshmukh, Mankar, Malu, & Mahore).

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An individual associated with prolonged sitting such as a student, undergoes modifications that can shorten the hip muscles, prolonged sitting creates an adjustment in pelvic alignment, which leads the hamstring to contract while sitting for a lengthy period of time that produces a considerable amount of tension on the muscle increases the chance of pathology as well (Pradip, Sudhir, & Nidhi, 2018).

Muscular "tightness" is defined as the reduction in actual length of a muscle, with minimal to substantial decrease in length or a restricted ability to extend from a conventional state (Hansberger et al., 2019). This affects the lengthto-tension ratio of muscles and the ability of the limb to absorb shock. Lack of flexibility has also been identified as a factor causing hamstring strain (Khan, Kanpariya, & Nanda, 2020).

Reduced flexibility due to tight muscle can also put direct pressure on blood vessels, resulting in reduced blood flow to the limb which can result in suboptimal performance. The hamstring muscles are commonly found to be shortened in this regard, they are mainly three muscular groups present: semitendinosus, semimembranosus, and biceps femoris, which constitute the posterior compartment. These are the dominant knee flexors and play a significant role in hip extension (Fatima, Qamar, Hassan, & Basharat, 2017).

Tight hamstrings can cause pelvic tilt, sacral rotation, extension, and hip rotation, resulting in poor spinal alignment (Kompal et al., 2022) because the tight hamstring muscles tend to twist the pelvis posteriorly and interfere with the normal biomechanics of the joint where it operates (Shukla & Patel). It can cause arthritis of associated joints and can be cured by ibuprofen microemulgel (Bhatti et al., 2022)

MATERIAL & METHODS

Study Design: Cross-sectional Observational Descriptive Study design

Sample size & Calculation: 370 and EPI tool was used to determine sample size

Sample Technique: Non-Probability Convenient Sampling Technique **Test Performed:** Passive Straight Leg Raise Test **Sensitivity:** 91% **Specificity:** 26^{1/2}

Inclusive Criteria

- Sitting hours More than 5 hours a Day
- Continuous sitting for more than 3 hours
- Students of 9th and 10th Grade
- Age Ranging 13yrs to 17yrs
- Both Genders

Exclusive Criteria

- Subjects having neurological deficits
- Subjects having fracture or orthopedic complications in lower limb
- Subjects not willing to participate
- Subject with any co-morbidity

METHODOLOGY

Data Collection Procedure and Tool:

The questionnaire given to the students was filled out by us after informed consent. The answers were recorded by their responses on the questionnaire and hamstring tightness was accessed by PSLR.

A universal Goniometer was used to measure the ranges. A goniometer is a device used to measure joint range of motion. A degree scale is normally located between the two arms, one of which is fixed and the other of which is adjustable. The fixed arm is aligned with the adjacent body segment, while the movable arm is with the body segment being measured (MOHAMED, ABD EL-MEGID, FADL, EL-AZIZY, & HATEM, 2019).

STATISTICAL ANALYSIS & RESULTS

Data was analyzed and compiled through SPSS version 25 and presented in graphical and tabulated form for better understanding.

Prevalence of Hamstrings Tightness

The percentage of Multan secondary or high school students with tight hamstrings was calculated and displayed in the pie chart.



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Figure- Pie chart of hamstrings tightness among students

Figure showed that out of 100% of the participants, 16.22% of students had PSLR ROM 80 or more than 80 degrees. Whereas 83.78% of students were having range less than 80 and were having hamstrings tightness.

Association between Sitting hours and Hamstrings Tightness

Cross tabulation was drawn to represent the sitting hours and presence or absence of hamstrings tightness. Chi-Square was used to examine the relationship between sitting hours and presence or absence of hamstrings tightness

Cross-tabulation						
Count						
		Prevalence of hamstring tightness				
		<80	80 or more	Total		
hours spent in sitting	5-6	31	4	35		
	7-8	94	38	132		
	9-10	183	18	201		
	>10	2	0	2		
Total		310	60	370		

Chi-Square Tests

	Value	df	Asymptotic Significance (2-sided)
Pearson Chi-Square	24.132ª	3	.000
Likelihood Ratio	23.452	3	.000
Linear-by-Linear Association	8.145	1	.004
N of Valid Cases	370		
a. 2 cells (25.0%) have ex	pected count	less than 5. ⁷	The minimum expected count is .32.

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Conclusion

According to the cross-sectional observational descriptive study more than forth-fifth of the students were having HMS tightness and is prevalent among adolescent students. The sitting hours were also associated with Hamstring Tightness. Acknowledgement:

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Table 02 showed that there were 35 students who used to sit for 5-6 hours, 31 out of them had hamstrings tightness. There were 132 students who used to sit for 7-8 hours, 94 out of them had hamstrings tightness. There were 201 students who used to sit for 9-10 hours, 183 out of them had hamstrings tightness and only 2 students reported that they used to sit for more than 10 hours a day, and both had hamstrings tightness. Chi-Square showed that there was statistical significance/association (p=0.004) between sitting hours and hamstrings tightness.

DISCUSSION

Hamstring tightness is the potential risk factor leading towards the various musculoskeletal and biomechanical conditions. However in school-going adolescents the occurrence of HMS tightness has not been studied properly. The purpose of this study was to investigate the HMS tightness and its clinical characteristics in school going adolescents. The current study showed that out of 100% participants 83.78% of adolescents were having PSLR ROM less than 80 degree and HMS tightness. This study focused on perception and apprehension of HMS tightness in young adults.

In support of this study, a research have been found and it states that most of the adolescents have HMS tightness and extended periods of sitting could possibly be a contributing factor to HMS tightness (Fatima et al., 2017).

The study showed that 9.5% students were sitting 5 to 6 hours, 35.7% were sitting 7 to 8 hours while 54.3% of the participants were sitting 9 to 10 hours in a day whereas 0.5% reported that they sit for more than 10 hours a day. To find the association between prolonged sitting hours and HMS tightness Chi square was applied and it showed that there was statistical significance.

The PSLR test was applied on both legs, for right leg it stated that maximum students were having ROM between 60 to 80 degrees with mean 73.29 and standard 6.743. In left leg, PSLR test showed that out of all participants, maximum students were having ROM 59 to 80 degrees with mean 73.29 and standard deviation 6.763.



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