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Prevalence of hamstring tightness among receptionists around Jalgaon City: A cross sectional study

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Abstract

Background: The purpose of study is to find the prevalence of hamstring muscle tightness in individuals who works as receptionists. It is possible to acquire the hamstring tightness as these individuals' works in sitting posture. Due to prolonged sitting working hours there is adaptive shortening of hamstring muscle. The flexibility of muscle progressively increases with time and decreases the level of physical activity.

Inability to extend the knee completely when the hip is flexed accompanied by discomfort or pain along the posterior thigh and/or knee is usually attributed to hamstring muscle tightness. Hamstring tightness occurs in early childhood and it tends to increase with age. The progressive decline in flexibility with age has been attributed to change in elasticity and decreased level of physical activities.

Aim: To find out prevalence of hamstring tightness among the receptionists.

Method: In this study 65 hospital based individuals according to inclusive and exclusive criteria were recruited from Dr Ulhas Patil Hospital, Jalgaon. There ages range from 20-40 yrs. The data was collected by using Active Knee Extension Test (AKE test).

Result: The study showed 152° average tightness according to active knee extension test.

Conclusion: The study concluded that the prevalence of hamstring tightness was significantly high in the receptionists.

Keywords: Receptionists, hamstring tightness, sit and reach test, flexibility

Introduction

The hamstring muscles are a group of muscle that runs along the back of thigh from the hip to just below the knee. The muscle group namely semitendinosus, semimembranosus, biceps femoris and ischial head of adductor magnus, which is located at the posterior aspect of the posterior thigh. These group of muscles originate from the ischial tuberosity of pelvis bone and continues along with the longitudinal axis of femur bone posteriorly and inserts into the tibia and fibula ^[1].

Flexibility is described as the ability to move a joint through its complete range of motion. It is the extensibility of muscle as well as non-contractile tissues, such as joint capsule, ligaments and tendons ^[3].

Inflexibility screening field test, the most common used measure is the sit- and reach test (SRT) ^[6]. SRT are commonly used to evaluate the hamstring and lower back flexibility ^[5, 7].

Maintaining hamstrings and low back flexibility may prevent acute and chronic musculoskeletal injuries and low back problems, postural deviations, gait limitations, and risk of falling ^[8]. The hamstring muscle and the measure of their length is due to certain dysfunction: patellofemoral joint dysfunction, pubic pain, low back pain (LBP) and postural deviations ^[9]. In older adults, tight hamstrings may lead to reduction in stride length and walking speed, which in turn can cause problems with dynamic balance.

The forward reach score does not distinguish between the contribution of lumbar and thoracic spine and the hip joint during reaching activity. The lack of hamstring muscle extensibility conditions a decrease in pelvic mobility [15]. Musculotendinous unit susceptible to injury can lead to some pathological conditions at the joint [3, 4, 7, 11]. Flexible muscles permit proper pelvic rotation. Therefore, when individual with low hamstring extensibility perform a maximal trunk flexion and posterior pelvic tilt occurs. The main factor seems to affect the validity to SRT to estimate hamstring extensibility are the difference in length proportion between the upper and lower limbs. Hamstring extensibility was associated with the decrease range of motion, flexion of pelvis and lumbar angle and the increased flexion of motion of thoracic angle.

Methodology

Material

1. Inch tape
2. pen
3. paper
4. resting table

Methodology

1. Study design-A sectional study.
2. Sampling method-Convenient sampling method.
3. Sample size: 68 subjects
(Using the Formula: $n = z^2 * p * (1 - p) / e^2$)
 $z = 1.96$ for a confidence level (α) of 95%, $p =$ proportion (expressed as a decimal), $e =$ margin of error.
3. Study setting - DUPMC
4. Duration- 6 months
5. Target population - 25-40 yrs of age
6. Outcome Measures – Sit and Reach test.

Selection Criteria

Inclusion

- Normal healthy receptionists working for ≥ 6 hrs for at least 5 days/week.
- Participants working for ≥ 1 year
- Participants with age group 25-40.
- Both gender Male and female.
- Individuals willing to participate in study.

Exclusion

- Recent history of fracture or sprain.
- Any other neurological or musculoskeletal problems.
- Recent surgeries around hip and knee.

Method

Participants approval taken from institutional ethical committee and informed consent were taken before commencement of study and detailed Procedure Explained To the Participants. Participants were selected after meeting inclusion criteria. There were 50 hospital based individual both male and female and data was collected using sit and reach test (SRT). Participants who are working as a receptionist for more that 6 hours per day for at least 5 days/week who been working for minimum 1 year. The participants sign an inform consent form and the study procedure were approved by Dr Ulhas Patil College of Physiotherapy, Jalgaon.

Outcome Measures

In this study, the data were collected with sit and reach test (SRT). For determining the prevalence of hamstring tightness in receptionists around jalgaon city, sit and reach test was used.

Data Analysis

N=68 participants were willing to be the part of study out of which n=50 subjects were screened and completed study. The entire data of the study was entered in MS Excel before it was statistically analyzed in Graph Pad InStat. Normality of data was confirmed by kolmogorov and smirnov test. All the results are shown in graphical format to visualize the statistical significant difference more clearly. The descriptive statistic was done for gender and age groups.

Table 1: Shows mean and SD of age and hamstring tightness of both male and female.

Age	Mean \pm SD of age
Male	29.72 \pm 3.97
Female	29.32 \pm 3.82

Table 2: Represents the tightness of hamstring in MALE

Range (in inches)	interpretation of SRT	Male
0-1.37	flexible	4 (16%)
1.38-5.11	tight	16 (64%)
5.12-12.2	Severely tight	5 (20%)

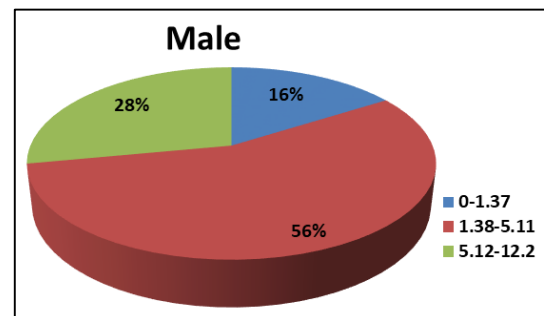


Fig 1: Show the distribution of flexible (0-1.37), tight (1.38-5.11), and severely tight (5.12-12.2) hamstring muscle in male population

Table 3: Represents tightness of hamstring in female population

Range (in inches)	interpretation of SRT	FEMALE
0-1.37	flexible	1 (4%)
1.38-5.11	tight	19 (76%)
5.12-12.2	Severely tight	5 (20%)

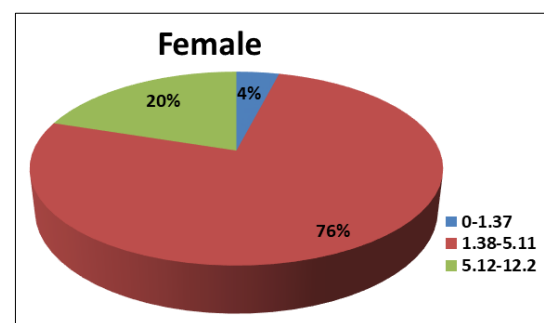


Fig 2: Shows the distribution of flexible (0-1.37), Tight (1.38-5.11) and severely tight (5.12-12.2) hamstring muscle in female population.

Table 4: Shows mean and SD of hamstring tightness in male and female

Gender	Mean of hamstring tightness on SRT
Male	4.53±2.97
female	4.58±3.40

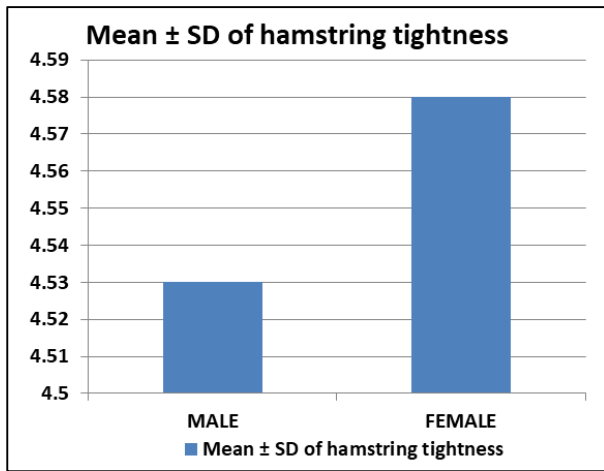


Fig 3: Shows the mean of hamstring tightness in male and female

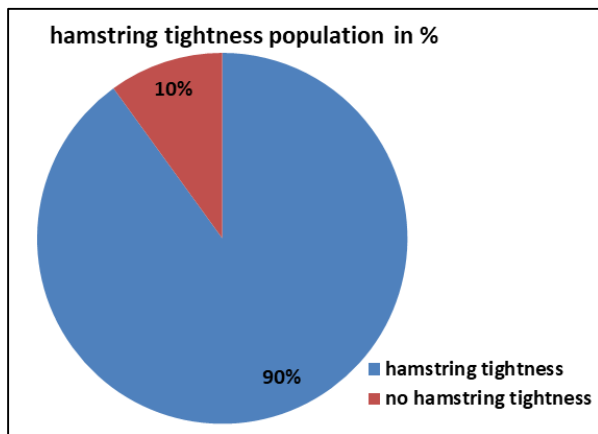


Fig 4: Shows 90% prevalence of hamstring tightness in total population

Result

Total 68 participants were selected for the study, assessment and analysis was carried out. Only individuals meeting inclusion criteria were taken in study, n=50 (male: 25, female: 25). In our study, the number of the male and the female participants were equally distributed.

The age group selected for the study was between 25-40 years of age, and the mean age was 29.72±3.97 for male participants and 29.32±3.82 for female participants.

In our study, there was significant hamstring tightness in both the male and the female receptionists around the jalgaon city. But it was observed that the female receptionists had the more tight hamstrings when compared to that of the male receptionists. The Sit and Reach test for studying hamstring tightness showed the mean of 4.53±2.97 in Male and 4.58±3.40 in Female participants.

Discussion

The aim of the study was to determine the prevalence of hamstring tightness among the receptionists. 50 subjects were recruited by convenient sampling method on the basis of inclusion and exclusion criteria from Dr. Ulhas Patil college

of physiotherapy, jalgaon, which included 25 male and 25 female participants. Hamstring tightness was measured with the help of inch tape under sit and reach test technique. Participants tried to touch their toes maximally without bending knees. In this study, mean and standard deviation of Sit and Reach test technique was recorded separately for both male and female subjects. The result showed significant hamstring tightness in both the male and the female candidates.

The subjects were divided into range of flexibility to severe tightness. Out of 25 male subjects (mention table/ graph number), 4 male candidates were flexible which accounts for 16% of total male subjects, 16 were having tightness which accounts for 64% of total male subjects and 5 were having severely tight hamstrings which accounts for 20% of total male subjects.

Whereas in female (mention table/ graph number), out of 25 subjects, only 1 female was flexible which accounts for 4% of total female subjects, 19 were having hamstring tightness which accounts for 76% of total female subjects and 5 were having severely tight hamstrings which accounts for 20% of total female subjects.

This study gives a clear indication that female participants have tighter hamstrings than that of the male subjects.

It is possible that tightness in hamstrings may be due to the lack of physical activity. The professional need of prolonged sitting posture in receptionists leads to the adaptive shortening of the muscle. Adaptive shortening may also lead to reduces hip flexion ability in individuals how have less physical activity and mat eventually lead to loss of balance and gait abnormalities.

The receptionists have more or less sedentary life style as they appear to be more in sitting posture due to long working hours than into physical activities. Therefore, receptionists should increase their physical activity in between their working hours. Not just hamstring muscle is the only one that is affected due to lack of physical activity but also other muscles of the body may get affected. It could be due to prolonged sitting posture or incorrect posture

To avoid or prevent such muscular deformity due to lack of physical activity some basic stretches must be performed by an individual during the work period.

Conclusion

Based on results of this study, our study concludes that there is significant hamstring tightness in both male and female subjects. Also female receptionists have greater prevalence of hamstring tightness than the male subjects.

In our study, out of 50 subjects, about 90% prevalence of hamstring tightness was found. Therefore, it is concluded that the receptionists have significant hamstring tightness as a result of adaptive shortening of the muscle due to prolonged sitting posture and long working hour.

Limitations

- Unavoidable minimal human error during measurement with the inch tape can be overcome by using digital scales
- Height and weight was not considered.
- Only 25-40 year old population was evaluated.

Recommendation

1. Future studies should consider large sample size.
2. Randomized controlled studies have to be in- cooperated

to improved flexibility of hamstring muscle.

Future Scope

- Future research can be done by recording response after any treatment protocol.
- Further studies can be conducted related to other muscle group.

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