ABSTRACT

Purpose of the Study: The hamstring muscles are important contributors to the control of human movement and are involved in a wide range of activities from running and jumping to forward bending during sitting or standing and a range of postural control actions. The sit-and-reach test (SRT) is a field test used to measure low back and hamstring muscle flexibility. Therefore, study contends that the flexibility of hamstring will get affected with Arab traditional sitting. Most of the Arab people have some shortening of hamstring muscles due to their style of sitting because of the knee flexion in Arab traditional sitting even the calf muscle also gets shortening and loss of flexibility. The purpose of this study is to assess hamstring muscle flexibility using the SRT test in Arab people who preferred traditional Arab sitting.

Materials and Methods: A total of 20 male Arab people who living in Saudi Arabia (age range 20–40 years) volunteered to participate, and without any significant history of pathology of the hip, knee, or thigh were enlist for this study. A standard sit-and-reach box was used to position the subjects for the test, and the sliding ruler that is centered on the top of the box was used to take the SRT scores.

Results: From the results, it has been noticed that age has P = 0.000968 which is highly significant due to which it plays significant effect. Age plays significant role in affecting the result whereas height does not play significant role in affecting the result of hamstring flexibility.

Conclusion: Differences in hamstring muscle length varies according to age, weight, or style of sitting. The active person has better flexibility than who preferred traditional Arab sitting.

Key words: Flexibility, hamstring and calf muscles, traditional sitting
Introduction

The hamstring muscles are important contributors to the control of human movement and are involved in a wide range of activities from running and jumping to forward bending during sitting or standing and a range of postural control actions.[1] The hamstring muscle strain is the most common injury in athlete’s people.

Reduced flexibility of hamstrings was reported to be associated with increased low-back pain frequency, herniated lumbar disc, reduce lumbar lordosis, reduce range of lumbar spine flexion, and increased the range of thoracic spine flexion, increased thoracic kyphosis angle in adolescents with Scheuermann disease and a higher risk of muscle injury.[2] Zachezeweski has defined muscle flexibility as “the ability of a muscle to lengthen, allowing one joint (or more than one joint in a series) to move through a range of motion (ROM)” and a loss of muscle flexibility as “a reduce in the ability of the muscle to perform,” resulting in reduce ROM of a joint.[3]

Muscle stretching is important because it is believed to provide many physical benefits, including enhanced flexibility, improved muscle performance, enhanced running economy (decreased energy expenditure at a given speed), injury prevention, promotion of healing, and possibly reduce delayed-onset muscle soreness.[4] The static stretch is a technique in which the muscle is slowly lengthened to tolerance (comfortable stretch, short of pain) and the position held with the muscle in this greatest tolerated length.[5]

The sit-and-reach test (SRT) is a field test used to measure low back and hamstring muscle flexibility.[6-8] According to the American Alliance for Health, Physical Education, Recreation, and Dance (AAHPERD), this test is important because decreased flexibility, mostly in the hamstring muscles and the back, is thought to be a factor of increase of low-back pain.[7] The SRT are regularly used to evaluate the hamstring muscle extensibility because the procedures are simple, easy to manage, require minimal skills training, and are particularly useful in large scale extensibility evaluation in the field setting.[8]

The Arab traditional sitting is people sitting on the floor with hip and knee flexed and the legs crossed each other. In general, the Arab people tend to sit with that style on the ground for prolonged time, when they have a meal they will have it on the floor and even when they sit with their family or their friends also they tend to sit on the floor.

Therefore, studies contend that the flexibility of hamstring will get affected with Arab traditional sitting. Most of the Arab people have some shortening of hamstring muscles due to their style of sitting because of the knee flexion in Arab traditional sitting even the calf muscle also gets shortening and loss of flexibility. The prolonged knee flexion even in the healthy people will get shortening in hamstring and calf muscle.

The purpose of the study is to check the hamstring muscle flexibility that may affect with traditional Arab sitting. The flexibility affected by shortening of the muscle and it can be measured by SRT. According to some studies, the SRT can measure the flexibility of hamstring muscle directly and calf muscle can be measured indirectly. Although several other methods of assessing hamstring muscle length have been reported.[7] The purposes of this study are to assess hamstring muscle flexibility using the SRT test in Arab people who preferred traditional Arab sitting.

Materials and Methods

Participants

A total of 20 male Arab people who living in Saudi Arabia (age range 20–40 years) volunteered to participate, and without any significant history of pathology of the hip, knee, or thigh were enlist for this study. Subjects were volunteers and signed an institutionally agreed informed consent statement.

A standard sit-and-reach box was used to position the subjects for the test, and the sliding ruler that is centered on the top of the box was used to take the SRT scores. The markings on the ruler were positioned so that the 23-cm mark represented the point at which the subject’s fingertips were in line with their toes. In this way, the SRT score was always a positive number, even for the subject who was unable to reach their toes. The minimal acceptable score to pass, as “determined by AAHPERD,” is 25 cm, or 2 cm beyond the toes, for all ages and both genders and without thought of anthropometric variables.
First, the subjects of age groups from 20 to 40 years old Saudi people were taken from Hail, Saudi Arabia. Each subject was seated on the floor with knees fully extended and ankles in neutral dorsiflexion against the box [Figure 1]. The subject was instructed to place one hand on top of the other and slowly reach forward as far as possible while keeping the knees extended. The hands were kept aligned evenly as the subject reached forward along the surface of the box [Figure 2]. Each subject practiced the movement twice, and on the third repetition, the SRT score (in centimeters) was recorded as the final position of the fingertips on the ruler.

Reliability of the hamstring flexibility measurements was determined using an SRT. To determine whether significant differences existed between the values of the two groups, two-way analysis of variance for repeated measures on one variable (test) was performed. Significance for all statistical tests was accepted at the 0.05 level of probability.

Results

From the results, we can see that age has $P = 0.000968$ which is highly significant due to which it plays a significant effect on the result whereas the height has $P = 0.0609$ which is not highly significant which means that height did not have a significant effect on the result.

These results mean that age plays significant role in affecting the result whereas height does not play significant role in affecting the result.

Discussion

The overall mean for our SRT measurements, the results indicate that hamstring muscle length is less in adult and who preferred traditional Arab sitting. These results suggest that we should modify our expectations for hamstring muscle length based on age.

The SRT and modified versions of the SRT, however, continue to focus on the distance of the fingertips to the toes of the final measure. Because this measure is influenced by a variety of factors, as previously discussed, the results may be misleading when developing strategies for interventions.

In the majority of cases, the typical action taken in response to the SRT score is to have the adult practice forward bending in the long-sitting position as an exercise to improve the score. Our concern about practicing the test as an exercise is greatest for an adult who have normal hamstring muscle. There is no evidence to support the need to increase hamstring muscle length beyond normal or that improving the SRT score is associated with a change in hamstring muscle length.

Our future studies will include (1) use of the inclinometer to measure hip joint angle (2) Investigation of a change in hamstring muscle length or back motion as a result of practicing forward bending in the long sitting position.

Conclusion

The measurement of flexibility is an important component of fitness testing. The SRT is useful for examining hamstring muscle length. Examiners should also recognize that there are differences in hamstring muscle length according to his age, weight, or style of sitting. The therapist should give the subject some exercises and stretches to improve the flexibility. The active person has better flexibility than who preferred traditional Arab sitting.

Declaration of patient consent
The authors certify that they have obtained all appropriate patient consent forms. In the form the patient(s) has/have given his/her/their consent for his/her/their images and other clinical information to be reported in the journal. The patients understand that their names and initials will not be published.
and due efforts will be made to conceal their identity, but anonymity cannot be guaranteed.

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Conflicts of interest
There are no conflicts of interest.

References