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Evaluation of Flexibility with Canadian Trunk Forward Flexion Test and Ymca Sit and Reach Test in Young Individuals: A Comparative Study.

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ABSTRACT

Flexibility is one of the important components of the health related physical fitness. Hamstring and low back flexibility is important for performing daily activities and to prevent development of muscular pain that may occur due to poor flexibility. Both Canadian trunk forward flexion test and YMCA sit and reach test are commonly used to measure flexibility. To evaluate and compare Canadian trunk forward flexion test and YMCA sit and reach test for flexibility. 103 subjects according to selection criteria were assessed for flexibility by using both the tests and order of performance was randomly designed. P=0.097 for flexibility measurement but P=0.000 for spinal movements. Both the methods are equally useful for measuring flexibility.

KEYWORDS: Flexibility, sit and reach test.

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INTRODUCTION

Flexibility is one of the important components of the health related physical fitness. Hamstring and low back flexibility is important for performing daily activities and to prevent development of muscular pain that may occur due to poor flexibility.Both Canadian trunk forward flexion test and YMCA sit and reach test are commonly used to measure flexibility.[1] For Canadian trunk forward flexion test,the participant sits without shoes and the soles of the feet flat against the flexometer (sit-and-reach box) at 26 cm mark. Inner edges of the soles are placed within 2 cm of the measuring scale[1,2]. While in YMCA sit and reach test, a measure tape is placed on the floor at a right angle to the 15-inch mark. The participant sits with the measure tape between the legs, with legs extended along with the taped line on the floor. Heels of the feet should touch the edge of the marked line and be about 10-12 inches apart[1].Studies are done for reliability and validity for both the tests.But evidences are still lacking for the comparison of both the tests.So, this study was conducted to evaluate and compare both the tests for measuring flexibility.

MATERIALS AND METHODS

This comparative study was conducted on 103 young individual according to the inclusion criteria. Individuals were recruited from Physiotherapy College and OPD. Inclusion criteria were kept as: age of 18 -25 years and who were willing to participate. The criteria for exclusion wereany pathological conditions affecting the whole body (Orthopedic, Cardiorespiratory, neurological and /or surgical conditions). After taking the informed consent participants were explained the procedure. Participants wereasked to take self-stretching of hamstring muscles(3 repetitions- 30 sec hold) for the warm up session[3].Then they went for both the tests. Sequence was random for both Canadian trunk forward flexion test and YMCA sit and reach test. For Canadian trunk forward flexion test,the participant sat without shoes and the soles of the feet flat against the flexometer (sit-and-reach box) at 26 cm mark. Inner edges of the soles are placed within 2 cm of the measuring scale. Then the participant was asked to place both the hands together with extended elbow and bent forwards to push the marker set on the box and hold the position for 2 sec. The spinal measurement was taken by the measure tape from lower end of the spinal vertebrae to C7 vertebrae.

Picture 1: Starting position of Canadian Trunk Forward Flexion Test.

Picture 2: Ending position of Canadian Trunk Forward Flexion Test.

While for YMCA sit and reach test, a measure tape was placed on the floor at a right angle to the 15-inch mark. The participant sat with the measure tape between the legs, with legs extended along with the taped line on the floor. Heels of the feet should touch the edge of the marked line and be about 10-12 inches apart. Then the participant was asked to place both the hands together with extended elbow and bent forwards and touch the measure tape by holding the position for 2 sec. The spinal movement measurement was taken by the measure tape from lower end of the spinal vertebrae to C7 vertebrae.

Picture 3: Starting position of YMCA sit and reach test.

Picture 4: Ending position of YMCA sit and reach test.

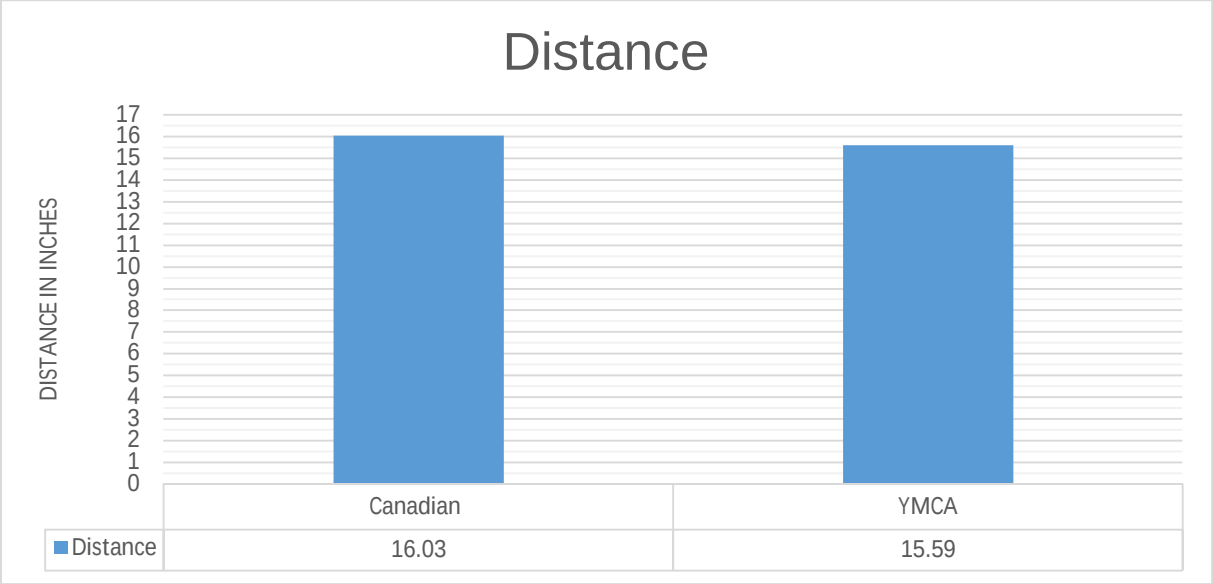
Picture 5: Measurement of the spinal movement, which was measured for both the tests.

RESULT

Data of 103 subjects were analyzed by using SPSS 16 and Microsoft Excel 2007. Paired t test was applied at 95% confidence interval to evaluate and compare Canadian Trunk Forward Flexion test and YMCA sit and reach test. The 103 young individuals had a mean (SD) age of 20.126 (1.311) years (Male = 40, Female = 63).

Table 1: Comparison of flexibility between both the tests.

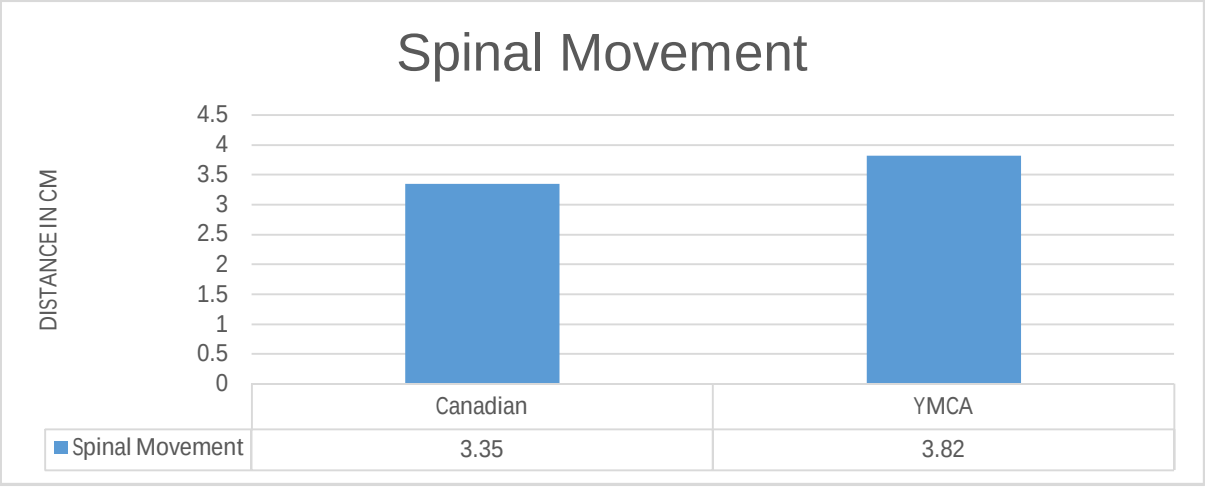
	Canadian Trunk Flexion Test	YMCA sit and reach test	P value
Distance in inches	16.03±3.31	15.59±4.46	0.097



Graph 1: Comparison of flexibility between both the tests.

Table 2: Comparison of spinal movement between both the tests.

	Canadian Trunk Flexion Test	YMCA sit and reach test	P value
Spinal Movement in cm	3.35±1.79	3.82±1.94	0.000



Graph 2: Comparison of spinal movement between both the tests.

Thus, There was no statistically significant difference found when paired t test was applied for distance measurement for both the test **(p>0.05)** but statistically significant difference was found for Spinal movement when compared for both the tests by applying paired t test**(p<0.05).**

DISCUSSION

The purpose of the present study was to evaluate and compare the Canadian trunk forward flexion test and YMCA test for measuring flexibility.Total 103 subjects were evaluated for flexibility measurement and have underwent for both the tests randomly.Results showed no significant

difference for distance measurement but significant difference was found for spinal movement.Both the test can equally measure the distance covered during sit and reach test.Difference in spinal movement was found may be due to height of the measuring device, amount of pelvic rotation and also the stabilization of the feet were different for both the test.So, tightness in the calf muscle as well as the mobility of the thoracolumbar fascia can affect the spinal movement. Limitation of the present study was that the angle of Dorsiflexion (Foot Position) was not measured objectively in YMCA test. But, flexibility measurements remained same for both the tests. So, one can measure flexibility by using YMCA test if Sit and reach box is not available, as there was no statistically significant difference for Canadian trunk flexion test and YMCA sit and reach test for measuring flexibility.[4,5,6,7]

CONCLUSION

Both Canadian Trunk Forward Flexion Test and YMCA sit and reach test are equally useful for measuring flexibility.

Take home message
Both the methods are equally effective for measuring flexibility.

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