A Study on Flexibility of the Lower Region Muscles College Students

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Abstract: The main aim of this study was compare lower region muscles flexibility of college students. For the purpose of study a total of 150 students were selected from various Colleges of Udaipur. The selected subjects were divided into three age groups i.e. eighteen, nineteen, and twenty year respectively. Sit and reach test was administered to measure the lower region flexibility. There was a significant difference obtain in the lower region and hamstring muscle between the three age groups (eighteen, nineteen, and twenty year). It can be concluded that the twenty year college students had better lower region flexibility when compared to the other two age group selected for the study.

Introduction - Flexibility was included in many workout batteries, a health-related fitness feature (ACHPER, 1996; Canadian Society for Exercise Physiology, 2003; Cooper Institute for Aerobics Research, 2004). Weak flexibility in the hamstrings and low back are linked to difficulties in carrying out and managing physical movements in everyday life (Bergstrom, et al., 1985; Myers, et al., 1985), and with chronic musculoskeletal pain so back problems, postural defects, gait limits, and the adult chance of decline (American College of Sports Medicine, 1998; Skinner, 1994). High hamstring flexibility was associated with low backaches in teenagers (Feldman, et al., 2001; Sjolie, et al., 2004). In fact, a deficiency of flexibility in teenagers has been recorded to be linked with an increased risk of lower back pain later in life (Kujala, et al., 1992). Flexibility is affected by several factors: joint structure, ligaments, tendon, muscles, skin, tissue, fat (or adipose tissue), grade, age and sex of body temperature behavior. These three factors affect the range of motion of a person over a joint. Flexibility is one aspect that is normally based in most fitness tests. Appropriate flexibility is an important feature of exercise connected to physical and wellness. The ability to move a joint through its full range of motion is characterized as flexibility. It is muscle extensibility and non- contractile tissues such as joint capsules, ligaments and tendons (Cornbleet & Woolsey, 1996). The value of flexibility as a health-related element of fitness is linked to the prevention of orthopedic disabilities late in life, particularly low back pain (Ruiz, et al., 2009). Inflexible muscles can make the musculotendinous unit susceptible to injury and can also lead to certain pathological circumstances in the joint it acts on (Fabunmi, et al., 2008)

The sit and reach (SR) test is a field test used for hamstring assessment and low back strength (Baumgartner, et al., 1995) This measure is present in most health-related fitness test batteries because it is claimed that retaining hamstring and low back stability will reduce acute and chronic musculoskeletal strains and low back issues, postural inconsistencies, gait deficiencies and risk of falling (ACSM, 2000).

Methodology: For the purpose of this study 150 college students were selected from various colleges of Udaipur. The age of the selected subjects ranged between 18 to 20 years. The selected subjects were divided into three age groups, Eighteen (n=50), Nineteen (n=50), Twenty (n=50). Lower back flexibility was measured by sit and reach test using Flexomeasure. For the statistical analysis, descriptive statistics, one way ANOVA and for pair wise comparison LSD was used. The significant value was set at 0.05.

Result and Analysis
The result of the current study has been displayed in the table no. 1, 2 and 3. Table 1: Descriptive Statistics
Table no. 1 (see in last page)
The table no. 1 shows the descriptive analysis of flexibility of 18 to 20 years age groups. It was found that the mean values of flexibility in college students of eighteen (18), nineteen (19), and twenty (20) is 34.64 + 6.56, 34.07 + 7.22 and 38.42 + 6.01 respectively.

Table 2: ANOVA

	Sum of Squares	Df	Mean square	F.	Sin.
Between Groups	677.852	2	338.926	7.525	.001
Within Group	12160.133	270	45.038		
Total	12837.985	272			

One-Way ANOVA showed in table 2 depicts a significant difference in flexibility scores between groups, f (2, 270) = 7.525, p<.01. It means the mean scores of flexibility in boys of eighteen (18) year age group, nineteen (19) year age group and twenty (20) year age group differs significantly. So, age directly affects the flexibility in different age groups.

Table 3 see in last page)

A LSD test was applied to measure the significant difference between the groups. Table 3 reveals that the flexibility of eighteen (18) year old school boys was statistically little higher (M= 34.64) than nineteen (19) year college boys (M=34.06).Table 3 also reveals that the flexibility of the twenty year college boys (20) was statistically higher (M=38.42) than the eighteen year (18) college boys (M= 34.64) and nineteen year (19) college students (M=34.06). The graphical representations of mean values of flexibility across all selected age groups are showed in the figure 1.

Figure-1
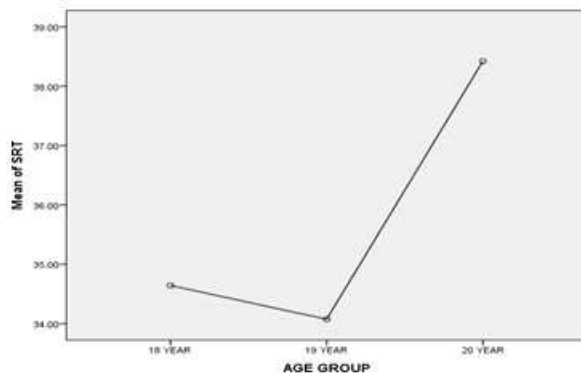
Discussion- One-Way ANOVA indicated a significant difference in flexibility scores between groups. The mean scores of flexibility in boys of eighteen (18) year age group, nineteen (19) year age group and twenty (20)year age group differ significantly. So, age influence the flexibility in different age groups. The flexibility of eighteen (18) year college students was statistically higher than nineteen (19) year college students and the flexibility of the twenty year college students (20) was statistically higher than the eighteen year (18) ollege students and nineteen year (19) old college students. Flexibility in both males and females is likely to decline after age 17, in part, as a consequence of a decline in physical activity and normal aging. The primary health benefits believed to be associated with resilience are low-back pain reduction and relaxation, musculoskeletal injury avoidance, and posture of better quality. These partnerships were found in adults with deceptive findings (Plowman, 1992). While flexibility has long been part of national youth fitness tests, creating a relation between flexibility and health has proven troublesome. (Institute of Medicine, 2012). Through lowering weight, increasing muscle mass and maintaining the muscles functioning, regular physical activity increases overall strength and range of movement.

Conclusion- Based on the finding of study, the following conclusions were drawn:

1. There was a slightly decrease in flexibility from 18 to 19 year followed by an increase by the age of twenty year.
2. Greater flexibility was observed in the 20 year old when compared to the 18 and 19 year old.

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Table 1

Flexibility	N	Mean	Std. Deviation	Std. error	95% Confidence Interval for Mean		Minimum	Maximum
					Lower Bound	Upper Bound		
18	128	34.6406	6.56852	.58058	33.4918	35.7895	20.00	52.00
19	95	34.0737	7.22767	.74154	32.6013	35.5460	15.00	48.00
20	50	38.4200	6.01050	.85001	36.7118	40.1282	25.00	50.00
Total	273	35.1355	6.87011	.41580	34.3169	35.9541	15.00	52.00

Table 3: Multiple Comparisons

(I) Groups	(J) Group	Mean Difference (I-J)	Std. Error	Sig.	95% Confidence Interval	
Dependent Variable: Flexibility						
LSD						
					Lower Bound	Upper Bound
18	19	.56694	.90881	.807	-1.5749	2.7087
	20	-3.77938[*]	1.11920	.002	-6.4170	-1.1417
19	20	-4.34632[*]	1.17253	.001	-7.1096	-1.5830

[*]. The mean difference is significant at the 0.05 level.

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