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Musculo Skeletal Fitness – Adolescent School Boys of South Indian States

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ABSTRACT

Participation in physical activity effectively promotes long term weight loss in adolescents. Being physically active may also make energetic improve your mind and reduce the risk of developing some chronic diseases. Mechanization and automation communication and transport, computer usage and television viewing have reduced the need for vigorous occupations discourage involvement in recreational activity. Musculo skeletal fitness refers muscular strength, muscular endurance and flexibility. Musculo skeletal fitness is an important factor in ability to carry out everyday tasks and enjoyable life. To achieve this purpose (N=15000) subjects were selected from Tamil Nadu (TN), Karnataka (KA), Kerala (KL),Andhra Pradesh (AP) and Puducherry (PY). Each state (n=3000) various districts of each state and each age group (n=750). The age group of subjects was 13 to 16 years. Muscular strength assessed with push-ups and muscular endurance assessed with sit-ups and flexibility was assessed with sit and reach test. The collected data treated with ANOVA, if obtained 'F'ratio is significant; scheffe's post test was to used to know the paired mean difference. The level of significant fixed at 0.05. The result of the study shows that muscular strength PY boys 13yrs were better followed by KL, TN, KA and AP boys. 14 yrs AP boys better strength followed by KL, TN, AP and KA boys. 15 yrs PY boys better followed by KL, TN, AP and KA boys. 16 yrs KL boys were better strength followed by PY, TN, KA and AP boys. Muscular endurance of 13 yrs,14 yrs, 15 yrs and 16 yrs PY boys better muscular endurance followed by KA,KL,TN and AP boys. Flexibility better 13 yrs, 14 yrs, 15 yrs and 16 yrs KL boys followed KA, PY, TN and AP boys. The researcher suggests that schools may a key role, physical education teachers and parents also great responsibility to encourage and support participating physical activities. The resolve the problem requires combined efforts at the educational, societal, corporate and governmental levels.

KEYWORDS: Muscular Strength, Muscular Endurance, Flexibility, Musculo Skeletal Fitness, ANOVA, Tamil Nadu (TN), Karnataka (KA), Kerala (KL),Andhra Pradesh (AP) and Puducherry (PY)

Introduction

Growth and development and maturation are terms that can be used to describe changes starting at conception at continuing through adulthood that occur in the body. Growth refers to an increase in the size of the body or any of its parts. A development refer's to differentiation along specialized lines of function. Musculo skeletal fitness refers to muscular strength, muscular endurance and flexibility. Musculo skeletal fitness is an important factor in ability to carry out everyday tasks and enjoyable life. The earlier in life individual becomes physically active the greater the increase in positive health benefits, however becoming physically active at any age will benefit overall health. Improved musculo fitness is associated with an enhanced health status. Participation in physical activity effectively promotes long term weight loss in adolescents **(Epstein et al., 1985).** Physical activity they are many other benefits associated with participation in physical activity across life span. Active participation in physical activity in childhood and adolescence is believed to enhance the uptake of calcium in the bones **(Chesnut 1990).**Physical activity by children is inversely associated with blood pressure **(Strazzullo et.al.,1988).** Muscular endurance prevents undue fatigue from work and other daily activities and allows greater success and enjoyment in athletic and recreational endeavors **(Golding et.al., 1989).** The primary purpose of the study was find out musculo skeletal fitness of adolescent school boys South Indian states.

Methodology

To achieve this purpose (N=15000) boys from various schools of Tamil Nadu, Karnataka, Kerala, Andhra Pradesh and Puducherry were selected. Each state (n = 3000) & each age group (n=750) samples of students from schools selected by stratified sampling method. In Tamil Nadu state (Vellore, Cuddalore, Erode, Dindigul and Virudhunagar districts and Karnataka state Kolar, Hassan, Shivmogga, Dharwad, Bagalkot and Gulburga districts and Kerala state (Kannur, Thrissur, Kottaiyam, and Tiruvananthapuram districts and Andhra Pradesh state (Chittor, Kurnool, Hyderabad, Adilabad, Vishakhapatnam and Krishna districts and Puducherry state Puducherry, Karaikkal, Mahe and Yanam districts were selected. The students age range from 13 to 16 years (8^{th} to 11^{th} std respectively). The selected criterion variables are muscular strength muscular endurance and flexibility these variables measured standard test items push-ups, timed sit-ups and sit and reach test were used. The collected data were statistically examined using ANOVA to find the significant difference if any. If the obtained 'F' ratio was significant, scheffe's post hoc test was used to know the paired mean difference. The level of confidence was fixed at 0.05.

RESULTS

TABLE: - 1 ANOVA FOR DIFFERENT AGE GROUP OF ADOLESCENT BOYS ON MUSCULAR STRENGTH OF SOUTH INDIAN STATES

AGE (yrs)	SOV	SS	df	MS	'F'
13	Between	5188.533	4	1297.133	215.51*
	Within	22540.80	3745	6.019	
14	Between	4744.693	4	1186.173	175.77*
	Within	25272.80	3745	6.748	
15	Between	3441.440	4	860.36	116.13*
	Within	27743.733	3745	7.408	
16	Between	2648.988	4	662.247	59.38*
	Within	41763.612	3745	11.152	

* Significant at 0.05 level of confidence

Table value 2.79 for significance at 0.05 levels with df 4 and 3745

Table – 1 shows the muscular strength of adolescent boys of different age groups of South Indian states. From the table it was clear the obtained 'F'- values are greater than table value (2.79) required for significant at 0.05 level with df 4 and 3745. The results of the study indicates that among the states significant difference were found on muscular strength for 13 yrs, 14 yrs, 15 yrs and 16 yrs adolescent boys. Hence, to find out the paired mean difference scheffe's post hoc test was applied and the results were presented in table – 2

TABLE: - 2 SCHEFFE'S TEST FOR MEAN DIFFERENCE OF DIFFERENT AGE GROUP OF SOUTH INDIAN STATES BOYS ON MUSCULAR STRENGTH

Age	TN Vs KA	TN Vs KL	TN Vs AP	TN Vs PY	KA Vs KL	KA Vs AP	KA Vs PY	KL Vs AP	KL Vs PY	AP Vs PY	C.I
13	0.45	1.40	0.50	2.50	1.85	0.05*	2.95	1.90	1.10	3.0	0.41
14	0.84	1.46	0.22*	2.19	2.30	0.62	3.03	1.68	0.73	2.41	0.44
15	1.28	0.75	0.49	1.48	2.03	0.79	2.76	1.24	0.73	1.97	0.46
16	0.43*	1.44	0.81	0.93	1.87	0.38*	1.36	2.25	0.51*	1.74	0.56

P > 0.05 ** Not Significant*

From the table-2 shows that KA and AP, TN and AP, TN and KA, KL and PY states no significant difference, rest of all other states shows significant are there in muscular strength.

Figure: 1 MEAN VALUES OF MUSCULAR STRENGTH ON DIFFERENT AGE GROUP OF SOUTH INDIAN STATES OF SCHOOL BOYS

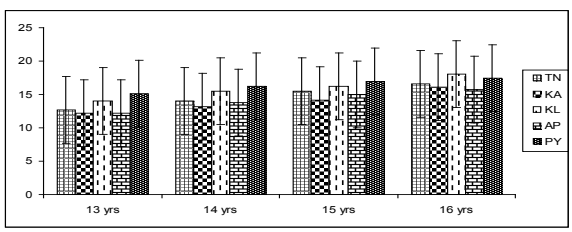


TABLE - 3 ANOVA FOR DIFFERENT AGE GROUP OF ADOLESCENT BOYS ON MUSCULAR ENDURANCE OF SOUTH INDIAN STATES

AGE	SOV	SS	Df	MS	'F'
13	Between	76253.276	4	19063.31	1397.7*
	Within	51076.476	3745	13.639	
14	Between	54017.569	4	13504.39	806.09*
	Within	62739.425	3745	16.753	
15	Between	53754.339	4	13438.58	819.81*
	Within	61388.755	3745	16.392	
16	Between	52701.374	4	13175.34	614.73*
	Within	80264.653	3745	21.432	

* Significant at 0.05 level of confidence

Table value 2.79 for significance at 0.05 levels with df 4 and 3745

Table – 3 shows the muscular endurance of adolescent boys of different age groups of South Indian states. From the table it was clear the obtained 'F'- values are greater than table value (2.79) required for significant at 0.05 level with df 4 and 3745. The results of the study indicates that among the states significant difference were found on muscular endurance for 13 yrs, 14 yrs, 15 yrs and 16 yrs adolescent boys. Hence, to find out the paired mean difference scheffe's post hoc test was applied and the results were presented in table – 4

TABLE :- 4 SCHEFFE'S TEST FOR MEAN DIFFERENCE OF DIFFERENT AGE GROUP OF SOUTH INDIAN STATES BOYS ON MUSCULAR ENDURANCE

Age	TN Vs KA	TN Vs KL	TN Vs AP	TN Vs PY	KA Vs KL	KA Vs AP	KA Vs PY	KL Vs AP	KL Vs PY	AP Vs PY	C.I
13	4.35	0.95	2.86	10.3	3.4	7.21	5.95	3.81	9.35	13.16	0.62
14	2.06	1.36	3.86	7.39	3.42	5.92	5.33	2.5	8.7	11.25	0.69
15	3.83	0.03*	2.03	8.64	3.86	5.86	4.81	2.0	8.67	10.67	0.68
16	4.58	0.42*	1.58	8.73	4.16	6.16	4.15	2.00	8.31	10.31	0.78

P > 0.05 ** No Significant*

From the table -4 shows that age of 15 yrs and 16 yrs TN and KL, no significant difference, rest of all other states shows significant are there in muscular endurance.

Figure: 2 MEAN VALUES OF MUSCULAR ENDURANCE ON DIFFERENT AGE GROUP OF SOUTH INDIAN STATES OF SCHOOL BOYS

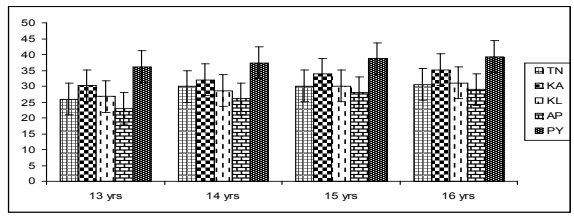


TABLE – 5 ANOVA FOR DIFFERENT AGE GROUP OF ADOLESCENT BOYS ON FLEXIBILITY OF SOUTH INDIAN STATES

AGE	SOV	SS	df	MS	'F'
13	Between	68986.507	4	17246.62	1484.8*
	Within	43498.667	3745	11.615	
14	Between	47230.240	4	11807.56	1034.3*
	Within	42750.933	3745	11.415	
15	Between	50881.44	4	12720.36	855.85*
	Within	55661.333	3745	14.863	
16	Between	56189.493	4	14047.37	733.78*
	Within	71692.8	3745	19.144	

* Significant at 0.05 level of confidence

Table value 2.79 for significance at 0.05 levels with df 4 and 3745

Table – 5 shows the flexibility of adolescent boys of different age groups of South Indian states. From the table it was clear the obtained 'F'- values are greater than table value (2.79) required for significant at 0.05 level with df 4 and 3745. The results of the study indicates that among the states significant difference were found on flexibility for 13 yrs, 14 yrs, 15 yrs and 16 yrs adolescent boys. Hence, to find out the paired mean difference scheffe's post hoc test was applied and the results were presented in table - 6

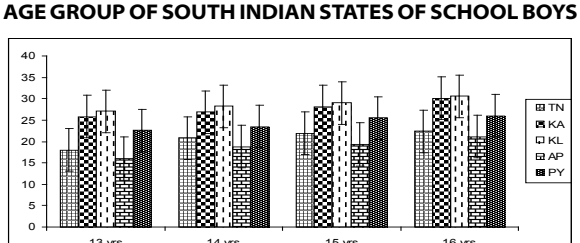
TABLE – 6 SCHEFFE'S TEST FOR MEAN DIFFERENCE OF DIFFERENT AGE GROUP OF SOUTH INDIAN STATES BOYS ON FLEXIBILITY

Age	TN Vs KA	TN Vs KL	TN Vs AP	TN Vs PY	KA Vs KL	KA Vs AP	KA Vs PY	KL Vs AP	KL Vs PY	AP Vs PY	C.I
13	7.8	9.04	1.99	4.6	1.24	9.79	3.2	11.03	4.44	6.59	0.57
14	6.1	7.4	2.0	2.7	6.2	8.8	2.6	9.72	3.52	6.2	0.57
15	6.2	7.12	2.6	3.6	0.92	8.8	2.6	9.72	3.52	6.2	0.65
16	7.7	8.2	1.3	3.61	0.50*	9.0	4.09	9.5	4.59	4.91	0.74

P > 0.05 ** Not Significant*

From the table - 6 shows that age of 16 yrs KA and KL, no significant difference, rest of all other states shows significant are there in muscular endurance.

Figure: 3 MEAN VALUES OF FLEXIBILITY ON DIFFERENT AGE GROUP OF SOUTH INDIAN STATES OF SCHOOL BOYS



Discussion on findings

Findings of our studies on muscular strength PY boys 13yrs were better followed by KL, TN, KA and AP boys. 14 yrs AP boys better strength

followed by KL, TN, AP and KA boys. 15 yrs PY boys better followed by KL, TN, AP and KA boys. 16 yrs KL boys were better strength followed by PY, TN, KA and AP boys. Muscular endurance of 13 yrs,14 yrs, 15 yrs and 16 yrs PY boys better muscular endurance followed by KA,KL,TN and AP boys. Flexibility better 13 yrs, 14 yrs, 15 yrs and 16 yrs KL boys followed KA, PY, TN and AP boys. These results conformity other studies the adolescents performance of strength, endurance and flexibility when they are reaching higher age performance also increased **(Andersen et.al., 1994).** The adolescents school boys and girls based on physical activity participation the musculo skeletal fitness also improved **(Armstrong et.al., 2000).** Adolescents' boys having better muscular fitness comparing than the girls and better flexibility on girls **(Carpensen et.al., 1985)**. Adolescents age and physical activity results shows that positive correlation depending on age increasing fitness are increased **(Sallis et.al., 2000).** Sri Lankan school students better muscular strength and flexibility comparing than Indian school students. Indian school students better muscular endurance comparing than Sri Lanka **(Bhavani.Ahilan 2010).** The sample 1264 people , age from 7 to 69 yrs. The variables muscular strength, endurance and flexibility measured. The results shows that 37% better of strength followed by 59% endurance and 64% flexibility better on over all strength **(Katzmarzyk et.al., 2001).**

Conclusions

The results of the study concluded that

- 13 yrs,14 yrs,15 yrs PY boys better muscular strength followed by KL,TN,KA and AP boys. 16 yrs KL boys better strength followed by PY,TN,KA and AP boys.
- 13 yrs, 14 yrs, 15 yrs and 16 yrs PY boys better muscular endurance followed by KA,TN,KL and AP boys.
- Flexibility of 13 yrs,14 yrs, 15 yrs and 16 yrs better KL boys followed by KA,PY,TN and AP boys.

Implications

The unique strength of physical education and sports exists in its capacity to enthuse a successive dream in successive young generations. The life style of today's generation has changed tremendously. The fitness of individuals has gone down badly. Students prefer video games rather than to soil ,sweat in the play fields. Schools may a key role, physical education teachers and parents also great responsibility to encourage and support living of their offspring. The resolve the problem requires combined efforts at the educational, societal, corporate and governmental levels.

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