

AGE RELATED CHANGES ON GROWTH AND MOTOR PERFORMANCE OF 12 & 13 YEARS BOYS

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ABSTRACT

Human beings differ in many ways in their external body form. The variations in physical out look of human are interesting aspects which has tempted the scientists to analyses and classify them. In this study an attempt has been made to find out the age related changes on growth and motor performance of 12 and 13 years boys. The subjects of the present study were selected randomly from the school of Naihati Narendra Vidyaniketan, 24 Pgs (N), WB. Thirty students of each age group's i.e.; 60 boy's students were randomly selected for this purpose. The criteria measured in this article were- Growth parameters i.e.; sitting height, chest girth & biceps girth and motor performance parameters i.e.; 4x10 m shuttle run, standing broad jump and 50 m run. The data on the growth and motor performance parameters were analyzed by applying ANOVA to find out significant differences if any between the two age groups. Significant results were found in sitting height, chest girth, biceps girth, 4x10 m shuttle run, SBJ & 50 m run.

Key Words: - Motor, Growth, Physical and Performance.

INTRODUCTION:

The beginning of biological growth and development during adolescence is signified by the onset of puberty, which is often defined as the physical transformation of a child into an adult. Anthropometric measurements and their relationship with various motor abilities are an important guide for coaches for classification and selection of sportsperson according to their age, ability etc. Examination of data on young athletes (12-18 years) shows that successful athletes have somatotype quiet similar to those of outstanding older athletes. Morphological characteristics have an important role to play in the performance of various physical activities. Research findings shows that soccer performance is significantly related to body weight, sitting height, arm length, thigh and calf circumference. Further it has been shown moderate positive correlation between thigh circumference three fitness components i.e. speed, strength and endurance and negative correlation between abdomen circumference and said three fitness

components. Sexual maturation should be used to assess the extent of biological growth and development and the individual nutritional needs of adolescents in place of chronological age. Children grow at different rates at different ages, and different children also develop at different rates, so there will be early and late developers. Not only are the rates of growth different, but also the changes in the body proportions can vary, and this will directly affect the ability to perform. A sound knowledge of processors of growth and development will enable coaches and teaches who are working with children, to organize the training programs that will be more beneficial to the children from a physical and psychological perspective.

THE PURPOSE OF THE STUDY:

1. To observe the growth characteristics of 12 & 13 years boys.
2. To observe the motor ability status of the said group of boys.
3. To analysis and compare the age wise differences, if any, the selected growth and motor performance variables among the 12 & 13 years boys.
4. To study the relationship between selected Growth and motor performance variables of said age group boys.

METHODOLOGY:

Subjects

The subjects of the present study were selected randomly from the school Naihati Narendra Vidyaniketan, 24 Pgs (N), WB. Thirty students of each age group's i.e. total 60 boy's students were randomly selected for this purpose.

Criterion Measured

Parameters	Measured by
1) Sitting Height (cm)	Standard measurement technique
2) Chest Girth (cm)	Standard measurement technique
3) Biceps Girth (cm)	Standard measurement technique
4) Agility (sec)	4 × 10 m. Shuttle Run

5) Leg Explosive Strength (cm.) Standing Broad Jump

6) Speed (sec) 50 m. Run

Statistical Procedure

The data on the growth and motor performance parameters were analyzed by applying ANOVA to find out significant differences if any among the age groups.

RESULTS & DISCUSSION:

Discussions were made on the basis of the findings of the present study and compared with available literatures.

Sitting height

Table-1: Mean and SD of sitting height (cm.) between the two groups

Age groups	Mean	SD
12 years	71.98	5.87
13 years	77.00	5.55



Table-2: ANOVA between the two age groups for sitting height

Source of variance	SS	df	MS	F
Between Groups	2218.32	4	554.58	24.59**
Within Groups	3179.62	141	22.55	
Total	5397.94	145		

* Sig. at 0.05 levels ** Sig. at 0.01 levels, NS –Not significant.

$F_{0.05(4,141)} = 2.44$, $F_{0.01(4,141)} = 3.46$

It was observed that mean score of sitting height of 13 years boys was relatively higher than 12 years boys. Mean scores of sitting height were statistically different and computed F-value was also significant. Teeple & Massey (1976) had shown that mean sitting height of 10, 11 and 12

years boys were 75.9, 77.0 and 79.2 cm. respectively. Bhatnagar et al. (1990) had found similar result. Higher the age higher was the sitting height. So it may be inferred that the sitting height was related to the age of the subjects.

Chest Girth

Table-3: Mean and S.D. of Chest Girth (cm.) between the two age groups.

Age of Subjects	Mean	S.D.
12 years	67.13	6.39
13 years	72.13	7.22



Table-4: ANOVA between the two age groups for Chest girth

Source of Variation	SS	df	MS	F
Between Groups	2821.43	4	705.36	26.06 **
Within Groups	3816.14	141	27.06	
Total	6637.58	145		

Among the groups 13 years boys had better chest girth than the 12 years boys. Mean scores of Chest girth were statistically different. Higher the age higher was the Chest girth. Slaughter et al. (1982) observed that the mean Chest circumference of 9.0-9.9, 10.0-10.9 and 11.0-11.9 years old American boys were 63.8, 66.8 and 68.4 cm. respectively. Brooks (1939) had also reported the similar results. Therefore, it may be concluded that so far Chest girth was concerned age factor was responsible for the higher mean value.

Biceps Girth

Table-5: Mean and S.D. of Biceps Girth between two groups (12 & 13 year's boys).

Age of Subjects	Mean	S.D.
12 years	20.59	2.34
13 years	22.42	3.11

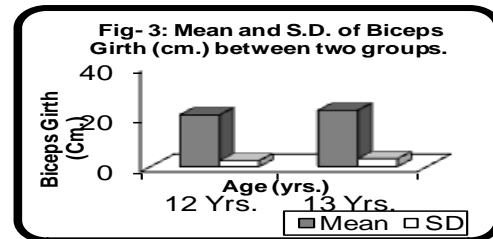


Table-6: ANOVA between the two age groups for Biceps girth.

Source of Variation	SS	df	MS	F
Between Groups	87.43	4	21.86	4.53 **
Within Groups	679.79	141	4.82	
Total	769.23	145		

Higher the age higher was the biceps girth. Slaughter et al. (1982) observed that the mean biceps circumference of 9.0-9.9, 10.0-10.9 and 11.0-11.9 years old American boys were 21.4, 23.1 and 23.6 cm. respectively. It may be seen from the observed 'F' value i.e., 4.53 were statistically significant at both 0.05 and 0.01 levels. 13 years boys had the higher biceps girth than 12 years group.

Shuttle Run

Table-7: Mean and S.D. of Shuttle Run (m /sec) between the two groups (12 & 13 year’s boys)

Age of Subjects	Mean	S.D.
12 years	11.75	0.53
13 years	10.86	0.70



Table-8: ANOVA between the two age groups for Shuttle Run (m / sec).

Source of Variation	SS	df	MS	F
Between Groups	13.47	4	3.37	11.21 **
Within Groups	42.36	141	0.30	
Total	55.82	145		

From the present study it was revealed that better performance in agility was observed in 13 years group. Clarke (1971) opined from a study of shuttle run that the performance increased in a straight line rise from ages 8 to 14 yrs. Analyzing the present study it may be concluded that this study was in agreement with the findings of the above researcher.

Standing Broad Jump

Table-9: Mean and S.D. of SBJ (cm.) between the two groups (12 & 13 year’s boys)

Age of Subjects	Mean	S.D
12 years	137.67	7.39
13 years	175.10	21.19

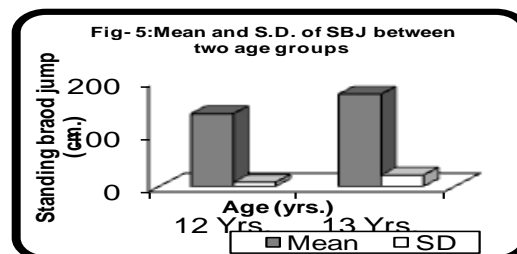


Table-10: ANOVA between the two age groups for Standing Broad Jump

Source of Variation	SS	df	MS	F
Between Groups	50887.69	4	12721.92	62.03 **
Within Groups	28919.68	141	205.10	
Total	79807.38	145		

Higher the age higher was the jumping ability. Chauhan et al. (1987) reported that age had been found to be positive and significant relationship with performance of standing broad jump. Slaughter et al. (1982) and Sodhi & Singh (1987) had shown the similar results. Analyzing the present study it may be concluded that this study was in agreement with the findings of the above researchers. So, from the findings of the present study it may be concluded that leg explosive Strength of boys increases with the increase in age which corroborates with the findings of Chatterjee et al. (1992).

50mt. Run

Table-11: Mean and S.D. of 50mt. Run (m. /sec.) between the two groups (12 & 13 year's boys).

Age of Subjects	Mean	S.D.
12 years	9.45	0.45
13 years	8.23	0.88



Table-12: ANOVA between the two age groups for 50m. Run

Source of Variation	SS	df	MS	F
Between Groups	32.59	4	8.15	20.42 **
Within Groups	56.25	141	0.40	
Total	88.84	145		

13 years boys performed better than the 12 years group and the 'F' value was 20.42 which were found statistically significant. Winter (1976) and Koinzer (1978) reported that sprint performance depends upon leg strength and leg length. It may be seen from Table-9 that 13 years boys had better leg strength with the advancement of age and these aspects possibly influenced the significant improvement in speed performance. According to Sing (1979) motor ability was best trainable in the time period in which it showed the maximum rate of growth. So, leading study was in close proximity to other researchers.

CONCLUSIONS:

Growth Parameters

- 1) 13 years group had better sitting height than the other groups.
- 2) 13 years boys had significantly higher chest girth. Age factor was responsible for the higher mean value.
- 3) Significant difference existed in biceps girth between the groups and 13 years boys had significantly higher biceps girth.

Motor Performance Parameters

- 4) 13 years boys were more agile than 12 years group.
- 5) 13 years boys had significantly better leg explosive strength than 12 years boys.
- 6) Better performances were observed in 13 years age groups boys. This increase in speed ability of boys may due to rapid improvement of leg explosive strength and movement frequency.

RECOMMENDATIONS:

1. The present study was delimited only to male students; the same type of study may be made with female students.

2. Similar investigation may be done using different growth and motor performance parameters other than those used in the study. Psychological and Physiological parameters which were not considered in the present study.
3. Similar study may be conducted on large samples and age groups other than those used in the study.
4. A comparative study can be undertaken using the same parameters of Indian and foreign subjects.
5. Similar study may be done using tribal and non tribal boys and girls.
6. An interested researcher may prepare norms for various growth parameters and physical activity on the basis of valid tests, on boys and girls of each district of West Bengal for proper evaluation.

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