

AGE RELATED CHANGES ON GROWTH AND MOTOR PERFORMANCE OF 14 & 15 YEARS BOYS

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ABSTRACT

In modern sports, the 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. Several factors such as age, height, weight and various growth and motor fitness parameters influence the selection of players. The most fundamental characteristic of life is movement. Man is born with certain fundamental movements; these movements in various forms express the existence of life from the minute microscopic organism to the higher animal. The variations in physical out look of human are interesting aspects which has tempted the scientists to analyze and classify them. Growth and Development of human being is a continuous process which begins at conception and ends at death. The term growth and development are often used interchangeably, but there is a difference in emphasis implied by each though growth considers to be one aspects of development. In this study an attempt has been made to find out the age related changes on growth and motor performance of 14 and 15 years boys. The subjects of the present study were selected randomly from the school Naihati Narendra Vidyaniketan of 24 Pgs (N) District, 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.; height, weight, thigh girth, calf girth, biceps girth and Motor Performance parameters i.e.; 4x10 mt. shuttle run, standing broad jump, stork stand and 600 yd. run & walk. The data on the growth and motor performance parameters were analyzed by applying ANOVA to find out significant differences if any among the various age groups. Significant results were found in height, weight, thigh girth, calf girth, biceps girth, 4x10 mt. shuttle run, SBJ, stork stand and 600 yd run & walk.

Keywords: Growth, Motor Performance and 14 & 15 years boys.

INTRODUCTION:

Man is born with certain fundamental movements; these movements in various forms express the existence of life from the minute microscopic organism to the higher animal. In the field of research in Physical Education and Sports, to study the relationship of human performance and body Growth, perhaps, is the oldest one. 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 analyze and classify them. Growth and Development of human being is a continuous process which begins at conception and ends at death. Right from the time of conception to the death in the full age of a human organism runs through various stages of growth and development viz. pre-natal and post-natal.

The term growth and development are often used inter changeably, but there is a difference in emphasis implied by each though growth considers to be one aspects of development.

THE PURPOSE OF THE STUDY-

- 1) To observe the growth characteristics of 14 & 15 years old 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 14 & 15 years old 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) Height (cm.)	Stadiometer
2) Weight (Kg)	Weighing machine
3) Thigh Girth (cm)	Using standard protocol
4) Calf Girth (cm)	Using standard protocol
5) Biceps Girth (cm)	Standard measurement technique

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|---------------------------------|------------------------|
| 6) Agility (sec) | 4 × 10 mt. Shuttle Run |
| 7) Leg Explosive Strength (cm.) | Standing Broad Jump |
| 8) Balance (sec) | Stork Stand |
| 9) Endurance (sec) | 600 yd run & walk |

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 various age groups.

RESULTS & DISCUSSION-

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

Height

Table-1: Mean and SD of height (cm.) between 14 & 15 age group boys.

Age	Mean	SD
14 years	151.03	5.95
15 years	155.94	5.60

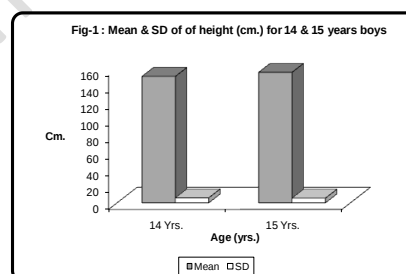


Table-2: ANOVA between the two age groups for height

Source of variance	SS	df	MS	F
Between Groups	3582.66	4	895.67	14.93**
Within Groups	8461.27	141	60.01	
Total	12043.93	145		

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

$F_{0-05(4,141)} = 2.44$, $F_{0-01(4,141)} = 3.46$

Higher the age higher was the height, Teeple and Massey (1976) had shown that the average height of 10,11 and 12 years old boys were 143.6, 147.6 and 152.4 cm respectively. Grassi et al. (2006) had found that standing height had significantly increased with age. F-value 14.93 was found significant at both levels. Comparing the observation of above leading researchers with the findings of the present study it may be concluded that 15 years boys were relatively taller in height than 14 years group.

Weight

Table-3: Mean and SD of Weight (kg) between 14 & 15 year's boys

Age of subjects	Mean	SD
14 years	38.02	6.41
15 years	40.17	4.23

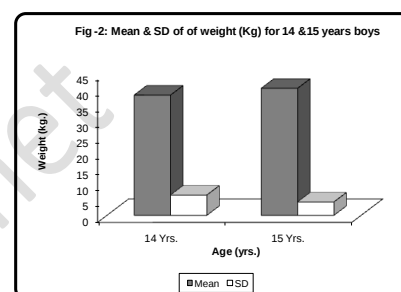


Table-4: ANOVA between the two age groups for weight

Source of variance	SS	df	MS	F
Between Groups	2850.87	4	712.72	14.24**
Within Groups	7058.42	141	50.06	
Total	9909.29	145		

Higher the age, higher was the body weight. Barabas and Eiben (1993) observed that 10, 11, 12 years old Hungarian boys carried the weight of 36.16, 35.39 and 39.49 Kg. respectively. Teeple & Massey (1976) and Shephard (1982) had shown similar results. Therefore, the present study was in close proximity to above researchers. F value 14.24 was statistically significant at both levels. It may further be inferred that body weight was related to the age of the subjects.

Thigh Girth

Table-5: Mean and S.D. of Thigh Girth (cm.) between 14 and 15 years boys

Age of Subjects	Mean	S.D.
14 years	41.18	5.00
15 years	37.85	1.27

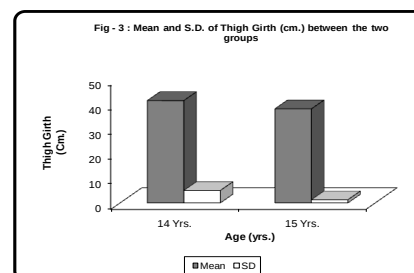


Table-6: ANOVA between the two age groups for Thigh Girth

Source of Variation	SS	df	MS	F
Between Groups	688.18	4	172.04	10.60 **
Within Groups	2289.07	141	16.23	
Total	2977.24	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 thigh girth of 14 years boys was significantly higher than that of 15 years boys. Banerjee et al. (1990) observed that higher thigh girth had positively correlated with performance than any other measurements in physical dimension. In the present study thigh girth of 14 years boys was higher than 15 years boys and 14 years group performed better than 15 years group in Shuttle Run test. 'F' value was found to be 10.60 which were statistically significant at 0.05 and 0.01 levels.

Calf Girth

Table-7: Mean and S.D. of Calf Girth (cm.) between 14 and 15 years boys

Age of Subjects	Mean	S.D.
14 years	29.93	2.94
15 years	27.25	0.94

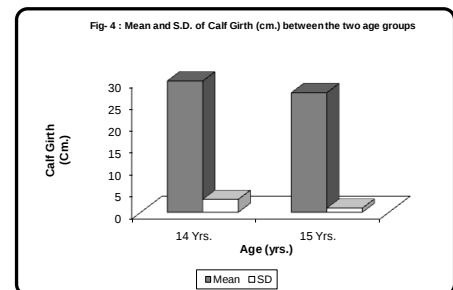


Table-8: ANOVA between the two age groups for Calf Girth

Source of Variation	SS	df	MS	F
Between Groups	209.71	4	52.43	8.19 **
Within Groups	902.98	141	6.40	
Total	1112.68	145		

It was found from Table-8 that calf girth of 15 years boys had lower than 14 years group and 'F' value was found 8.19 which were statistically significant at 0.05 and 0.01 level. Banerjee et al. (1990) observed that higher calf girth had positively correlated with performance when studied on 43 male athletes aged from 14 to 18 years. Analyzing all the relevant data and statistical treatment it appeared 14 years boys had significantly higher calf girth than 15 years group and they performed better than the other group in Shuttle Run test.

Biceps Girth

Table-9: Mean and S.D. of Biceps Girth between 14 & 15 years boys.

Age of Subjects	Mean	S.D.
14 years	20.82	2.23
15 years	21.03	0.84

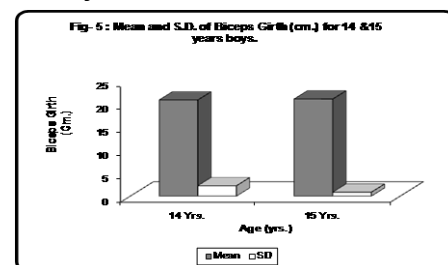


Table-10: ANOVA between the two age groups for Biceps Girth.

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. It appeared 15 years boys had significantly higher biceps girth than 14 years group. This improvement has a bearing on motor performance.

Shuttle Run

Table-11: Mean and S.D. of Shuttle Run (m /sec) between 14 & 15 years group.

Age of Subjects	Mean	S.D.
14 years	11.20	0.46
15 years	11.49	0.59

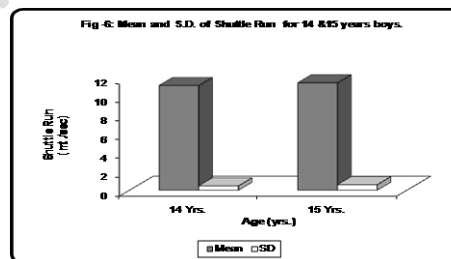


Table-12: ANOVA between the two age groups for Shuttle Run (m / sec).

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 14 years boys had performed better than 15 years boys. Several investigators reported that agility improved rapidly before puberty because of early maturation of central nervous system. Clarke (1971) opined from a study on shuttle run that the

performance increased in a straight line rise from ages 8 to 14 years. 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-13: Mean and S.D. of SBJ (cm.) between 14 & 15 year's boys

Age of Subjects	Mean	S.D.
14 years	171.37	15.92
15 years	180.13	11.43

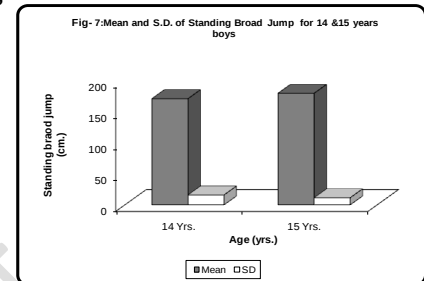


Table-14: ANOVA between the two age groups for Standing Broad Jump

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 15 years boys were better than 14 years group.

Stork Stand

Table-15: Mean and S.D. of Stork Stand (sec) between 14 & 15 year's boys

Age of Subjects	Mean	S.D.
14 years	76.13	33.32
15 years	98.13	59.21

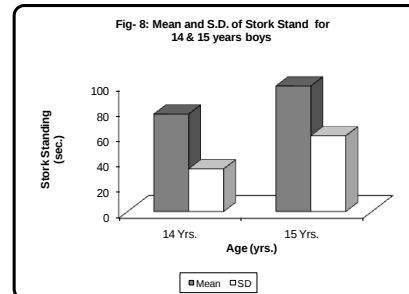


Table-16: ANOVA between the two age groups for Stork Stand

Source of Variation	SS	df	MS	F
Between Groups	36575.02	4	9143	4.18**
Within Groups	308396.48	141	2187.21	
Total	344971.51	145		

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

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

Higher the age higher was the balance ability. Gallahue (1982) reported from the findings of Kcogh (1965), De Oreo (1971) and Van Slooten (1973) that static balance ability of children showed a linear trend toward improved performance with age. Geuze(2003) showed improvement of static balance with age. So, from the findings of study and analyzing the relevant data it appeared that 15 years boys had higher balance ability than 14 years group.

600 yd Run & Walk

Table-17: Mean and S.D. of 600 yd Run & Walk (y/min) between 14 & 15 years' boys

Age of Subjects	Mean	S.D.
14 years	2.26	0.06
15 years	2.23	0.05

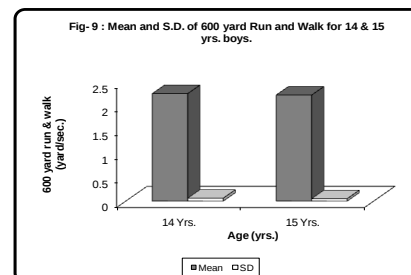


Table-18: ANOVA between the two age groups for 600 yd Run & Walk

Source of Variation	SS	df	MS	F
Between Groups	0.06	4	0.01	5.14 **
Within Groups	0.40	141	0.00	
Total	0.46	145		

In the present study it was observed that endurance ability of 15 years boys showed better than 14 years group. So it can be concluded that 15 years boys were better than 14 years boys in respect of 600 yards Run & Walk. The computed 'F' Value was 5.14 which reflect significant difference between the two means. So it can be concluded that 15 years boys were better than 14 years boys in respect of 600 yards Run & Walk.

CONCLUSIONS-

GROWTH PARAMETERS

- 1) 15 years boys were relatively taller in height than 14 years group.
- 2) Body weight was related to the age of the subjects and 15 years boys had better weight than 14 years.
- 3) In the present study thigh girth of 14 years boys was higher than 15 years boys.

- 4) 14 years boys had significantly higher calf girth than 15 years group.
- 5) Significant difference existed in biceps girth between the two groups and 15 years boys had significantly higher biceps girth than 14 years group.

MOTOR PERFORMANCE PARAMETERS

- 6) 14 years boys group was more agile than 15 years group.
- 7) Maximum leg explosive strength was observed in 15 years group.
- 8) 15 years boys had higher balance ability than 14 years group. This is due to maturation of central nervous system.
- 9) Endurance ability of 15 years boys showed better than 14 years group.

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