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Comparison of Anthropometric Variables and Physical Performance of Athletes and Non-Athletes

Lakhwinder Singh
Associate Professor,
Deptt. of Physical Education,
MGKM Shahi Sports College of Physical Education,
Samrala, Ludhiana

Abstract

In this research paper researcher has conducted study on comparison of anthropometric variables and physical performance of athletes and non-athletes. For these purpose eighty boys of age 16 to 18 years were selected as subjects. Body measurements were taken by following the standard technique of Tanner et al (1969). Somato type were assessed with the help of Health and Carter method (1967). Percentage of body fat was estimated by applying the equation of Slaughter et al. (1980). Mean, standard deviation and independent student't' test were used as statistical tools. The results of present study indicated that the rural Non-athletes being physical active did not differentiate much than the Athletes.

Keywords: Anthropometric Variables, Athletes, Physical Performance.

Introduction

Physically fitness is the basic need of our life. Good physical fitness level is the art of humanity. It is the fundamental form of human expression. It is the means of enhancing national prestige. It is an avenue of social adjustment. It is the most saving graces in the world. According to Bucher (1958), Physical fitness is the ability of an individual to live a balanced life. It involves Physical, Mental, Emotional and Spiritual factors and the Capacity for their wholesome knowledge.

The daily routine and body structure plays a effective role in physical performance. In many research papers and studies shows that regular training accelerates the growth process. Increase in stature and weight has also been seen when regular endurance training was given, (Godin 1920, Ekbom 1969, Ericon 1972). It is important to know that children subjected to training were adolescents. Thus it is very difficult to attribute these differences to the specific effect of exercise. In this paper attempt has been made to assess and compare the anthropometric characteristics and physical performance of Athletes and Non-athletes of Punjab.

Material and Methods

For the purpose of present study, eighty boys as sample was selected of age 16 to 18 years of different schools of district Ludhiana (Punjab).Out of that eighty boys, forty boys were athletes, who participated at Punjab state level competition and other were non-sports , who never participate in any competition at any level. Various body measurements including linear diameters, circumfrances and skin folds were taken by following the standard technique of Tanner et al (1969). Somatotype were assessed with the help of Health and Carter method (1967).Percentage of body fat was estimated by applying the equation of Slaughter et al. (1980).The mean, Standard deviation and independent student 't' test were used as statistical tools. In addition to anthropometric characteristics, for assess their physical performance the following tests were conducted:

1. For Speed:- 50 meter run.
2. For Endurance:- 600 meter.
3. For flexibility:- Sit and reach test.
4. For explosive strength:- Standing broad jump.
5. For Agility:- Shuttle rum (10x4meter).

Result and Discussion

Table-1
Descriptive Statistics of Various Anthropometric and Body Composition Variables in Athletes and Non-Athletes Aged 16 to 18 Years

Variables Components	Athletes		Non-Athletes		't' value
	N=40		N=40		
	M	SD	M	SD	
Age (yrs)	17.68	1.78	17.98	.63	.78
Weight (kg)	55.92	6.07	53.55	6.13	1.98
Height (cm)	167.06	6.08	165.43	5.23	1.94
Biacromial diameter (cm)	37.56	1.39	38.40	1.23	1.86
Bicristal diameter (cm)	32.22	1.43	30.47	2.18	1.67
Humarus diameter (cm)	6.18	0.32	7.05	.22	1.57
Femur diameter (cm)	9.23	.29	9.22	.19	7.69**
Waist circumference (cm)	69.89	1.64	69.90	1.88	5.27**
U. Arm circumference (cm	29.55	3.19	28.49	1.47	1.98
Calf circumference (cm)	34.13	1.68	32.33	1.24	1.83
Subcapular skinfold (mm)	11.46	1.54	12.14	1.62	1.93
Supraliac skinfold (mm)	12.78	1.64	12.15	1.69	1.97
Calf skinfold (mm)	13.07	.98	14.36	.97	1.16
Body fat %	18.96	1.96	19.34	1.68	1.17
Lean body mass %	85.06	1.96	19.39	1.68	1.17

*Significant at 0.05 level
**Significant at 0.01 level

Table-2
Descriptive Statistics of Various Somatotype Components in Athletes and Non-Athletes Aged 16 to 18 Years

Components	Athletes		Non-Athletes		't value
	N=40		N=40		
Endomorphy	3.17	.32	3.38	.31	3.87**
Mesomorphy	4.09	8.77	3.87	1.67	1.39
Ectomorphy	2.52	1.06	2.88	1.30	1.34
**Significant at 0.01 level					

Table-3
Descriptive Statistics of Various Physical Performancetests in Athletes and Non-Athletes Aged 16 to 18 years

Test	Athletes		Non-Athletes		't value
	N=40		N=40		
50 meter run (sec)	7.86	.42	7.90	.52	1.88
Standing broad jump (cm)	188.25	4.52	186.23	9.18	6.33*
Shuttle run (sec)	10.66	.56	13.05	.70	1.89
600 meter run (sec)	2.72	.15	2.63	.27	1.87
Sit & reach test (inches)	14.30	1.67	13.51	1.43	1.85
**Significant at 0.01 level					

Table-1 shows the distribution of mean values and standard deviation of different anthropometric measurements and body composition among the athletes and Non-athletes boys aged 16-18 years. Athletes were heavier and taller than Non-athletes but the difference was statistically non significant. By comparing the body diameter it was observed that Athletes boys have slightly greater girth at all diameter but the significant difference ($p<0.01$) was only observed in humar diameter.

The waist circumference of Non-athletes was found to be larger than athletes' boys with significant difference at 0.01 level of significant. Rest all the circumference did not show much difference. Athlete's boys possessed lesser values of skinfolds thickness at various site than Non-athletes. Significant difference ($p<0.05$) was only observed in superalliac skinfold. It is interesting to observe that Athletes boys on the everage possess less body fat percentage (18.96%) than Non-athletes (19.34%) the stunts "t" test further confirms the statistically non significant difference between mean of two groups. Consequently athletes are leaner having greater lean body mass (85.06%) than their counterparts, however the difference is non significant.

Table-2 shows that the Athletes significantly differ on the different components of somatotyping. Athletes have 3.17 - 4.09 - 2.52 somatotype rating as compared to non-athletes 3.38–3.87 – 2.88. It showed that athletes were significantly more endomorphic (t-value = 3.87, $p<0.01$). However no significant difference was observed in mesomorphy and ectomorphy components between two groups.

Table -3 indicates that comparative results of physical performance tests between two groups. It is evident from table that the average means score in all

the physical performance tests were in favors of athletes. The statically significant difference ($p<0.01$) was only noted in the test of standing broad jump.

Conclusion

It is concluded from the above result that there was no much difference between Athletes and Non-athletes boys in term of physique, body composition and physical performance. Routine physical work might be the reason change radically the body composition and consequently improve the performance of Non-athlete boys living in rural area.

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