

A COMPARISON OF SELECTED FITNESS VARIABLES OF CBSE SCHOOL CHILDREN

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ABSTRACT

The purpose of the study was to compare the selected fitness variable of athletes and non-athletes studying in C.B.S.E. Schools of Bilaspur district. One hundred male (Athletes = 60, Non-athletes = 40) children were selected for the purpose of investigation. Data was collected randomly from male athletes and non-athletes. The Queen's College Step Test (Cardiovascular endurance), Standing broad jump (Explosive strength of leg), Grip strength of Right & Left arm (Explosive Strength of arm), Bent arm hang (Arm and Shoulder strength), Sit-Ups (Muscular strength & endurance of Abdomen and back), Sit and reach test (Abdominal strength endurance), Shuttle run (Speed and agility), and Flamingo Balance (Total body balance) were carried out along with the weight and height to determine the body mass Index (BMI). To find out the significance of differences between male sportsperson and non-sportsperson in their physiological and physical fitness variables, means, standard deviations, and t-ratios were computed. Results of study concluded that the athletes and non-athletes did not differ significantly in their heart rate, cardiovascular endurance, BMI variables of physiological fitness. Athletes and non-athletes exhibited the similarity in their Explosive strength of leg, arm and shoulder strength, flexibility, agility, total body balance and , Explosive Strength of arm except Muscular strength & endurance of Abdomen and back parameters of physical fitness, when they were compared each others.

Keywords: Health related fitness, BMI, Queen's college step Test, Athletes and non-athletes

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INTRODUCTION

Participation in sports is one of the common traits of human character and it starts to develop from the very beginning of childhood. But, with the development of age, some people participate in recreational sports or amateur sports whereas very few individual dedicate themselves to become true sportsmen by regular practice and training which enable them to improve their psychological adjustments towards their goal. The characteristics of an athlete mainly depend upon physical fitness, having components like muscular strength and endurance, cardio- respiratory endurance, flexibility, speed, power, agility, balance etc. But, these components, may vary in sportsmen involving different sports activities.

Children who participate in physical fitness programs are reported to have higher self-concepts than those who are inactive although not all studies have reported positive relationships between fitness and childhood self-esteem. Despite these inconsistencies, a recent review on this topic suggests that children who participate in appropriately prescribed aerobic exercise programs have the potential to increase their self-efficacy, creativity, self-esteem, internal locus of control, test scores on cognitive functioning and classroom behavior.

Physical fitness is a dynamic construct and is continually growing in importance to everyday life and health. Although being an attribute that has a genetic basis, it is also sensitive to changes in type and amount of physical activity, especially as people age. It is important to measure fitness both as an outcome of physical activity and as a mediator of physical activity's effect on disease morbidity, mortality and injury. The measurement of fitness should become an important part of surveillance systems that track physical activity and risks for disease or injury (Dishman, Washburn & Heath, 2004:42). Physical fitness is a complex term that cannot be captured in one definition. The World Health Organisation (WHO) has defined fitness as "the ability to perform muscular work satisfactorily." While this may be an acceptable definition of the construct of physical fitness, the definition does not specify the ways that physical, social and psychological circumstances can vary to determine what is satisfactory, nor does it acknowledge that several abilities exist, rather than a single overall ability. Physical fitness is better understood by defining the specific components that can be measured and the circumstances in which those components relate to bodily function and health or reduced disease. The United States of America, Centres for Disease Control and Prevention defined physical fitness thus: "The five health-related components of physical fitness are more important to public health than are the components related to athletic ability. Operational definitions of physical fitness vary with the interest and need of the investigators." This definition of physical fitness focuses on the difference between health-related physical fitness and athletic ability physical fitness. From the perspective of the health of the nation, the health-related components are more important than those related to athletic ability (or are skill-related or performance-related components) (American College of Sports Medicine (ACSM), 2005:3). The distinction between the health-related versus the athletic ability components of physical fitness is in

Physical fitness is the sum total of five components namely Strength, Speed,

Endurance, Flexibility and Coordinative abilities, these five motor abilities and their complex forms (e.g. Strengths-Endurance Explosive strength etc) are the basic pre-requisites for human motor action therefore the sports performance in all sports depends to a great extent on these abilities. The improvement and maintenance of Physical fitness or condition is perhaps the most important aim of Sports training. Each Sport requires a different type and level of Physical condition (Specific fitness/condition) and as a result different type of fitness training is required for different sports. Some sports like distance running require a very high level of endurance but a low level of other motor abilities. Sports like shooting and Archery do not require a high Physical condition (Singh, 1991).

Physical fitness is the capacity to do prolong hard work and recover to the same state of health in short duration of time. Physical fitness is the ability to carry out daily tasks with vigor and alertness, without undue fatigue, and with ample energy to engage in leisure pursuits and to meet emergency situations. Physical fitness is the capacity to do prolong hard work and recover to the same state of health in short duration of time. This is the result of the degree of power, agility, strength, speed, flexibility and endurance one possesses. Physical fitness is the capacity to meet the present and potential physical challenges of life with success (Clarke & Clarke, 1987).

Chand (1977) concluded that offensive athletes were faster and had more endurance than defensive athletes. There was no significant difference between offensive and defensive athletes in agility. Kaur (1988) revealed that the physical fitness level of public school students was better than that of high school students. Sidhu (1991) investigated that the rural girls were superior in flex arms hang shuttle run, 50 yard dash and 60yard endurance than urban girls. Das et. al. (2007) indicated that among the physical fitness components only leg power showed significant higher value in sprinters than football athletes.

This study compared the physical and physiological fitness of male athletes and non-athletes studying in secondary school of education of Bilaspur district.

METHODOLOGY

Selection of Subject

One hundred male (Athletes = 60, Non-athletes = 40) children were selected for the purpose of investigation. All the respondents belong to C. B. S. E recognized schools running in Bilaspur region and data was collected randomly from male children studying in C. B. S. E recognized schools.

Instrumentation

The Queen's College Step Test (Cardiovascular endurance), Standing broad jump (Explosive strength of leg), Grip strength of Right & Left arm (Explosive Strength of arm), Bent arm hang (Arm and Shoulder strength), Sit-Ups (Muscular strength & endurance of Abdomen and back), Sit and reach test (Abdominal strength endurance), Shuttle run (Speed and agility), and Flamingo Balance (Total body balance) were carried out along with the weight and height to determine the body mass Index (BMI). Euro-fit test battery is a valid and reliable method for collecting data. This battery test measured the health related fitness

in children.. List of the tests, parameters and their criterion measures are given in Table 1.

TABLE 1
PARAMETERS AND THEIR CRITERION MEASURES

S. NO.	Test	Parameters	Criterion Measure
1.	The Queen's College Step Test	Cardiovascular endurance	Recovery Heart rate- Beats/minutes.
2.	Standing broad jump	Explosive strength of leg	recorded to the nearest 0.01 cm
3.	Grip strength (Right & Left)	Explosive Strength of arm	recorded to the nearest 0.1 kg
4.	Bent arm hang	Arm and Shoulder strength	Time recorded in seconds
5.	Sit-Ups	Muscular strength & endurance of Abdomen and back	Count maximum umber of sit-ups in 30 seconds
6.	Sit and reach test	Abdominal strength endurance	
7.	Shuttle run (10 x 5 Meter)	Speed and agility	Time recorded in seconds
8.	Flamingo Balance	Total body balance	Number of losses of balance IN 60 seconds

RESULTS AND DISCUSSION

The statistical analysis of data on Queen's college step test, standing broad jump, right and left grip strength, bent arm hang, sit-ups, sit and reach test, shuttle Run, and flamingo balance test collected of one hundred male athletes and non-athletes studying in C.B.S.E recognized schools of Bilaspur region was employed by using S.PSS 16.0 version., In order to find out the significance of differences between male athletes and non- athletes in their physiological and physical fitness variables, means, standard deviations, and t-ratios were computed. To check the obtained t-ratio, the level of significance was set at .05 level and data pertaining to this have been presented in Table 2 to 3 and depicted in Figure 1 to 11.

TABLE 2
SIGNIFICANCE OF DIFFERENCE BETWEEN MEAN SCORES OF HEART RATE, PREDICTED VO₂ MAXIMUM AND BMI OF MALE ATHLETES AND NON- ATHLETES

Variables	Category	Mean	MD	σ DM	t-ratio
Heart rate	Athletes Non-Athletes	139.09 147.54	8.45	3.04	2.78*
Predicted Vo ₂ max.	Athletes Non-Athletes	43.49 41.12	2.37	2.21	1.07
BMI	Athletes Non-Athletes	22.25 21.03	1.22	0.69	1.76

*Significant at .05 level, t.05 (98) = 1.98

It is evident from Table 2, that there was no statistically significant difference was

found between the means of heart rate of male athletes and non-athletes, as the obtained t-value of 2.78 was higher than the required value of $t_{.05(98)}=1.98$. In case of cardiovascular endurance (Vo_2 max.) and BMI variables of physiological fitness, statistically significant difference was not found male athletes and non-athletes, as the obtained t-values of 1.07 and 1.76 respectively were less than the required value of $t_{.05(98)}=1.98$.

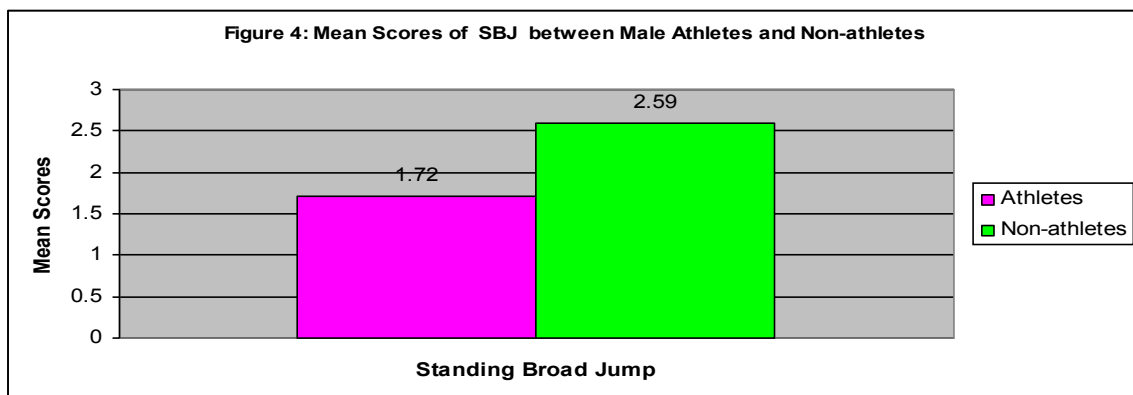
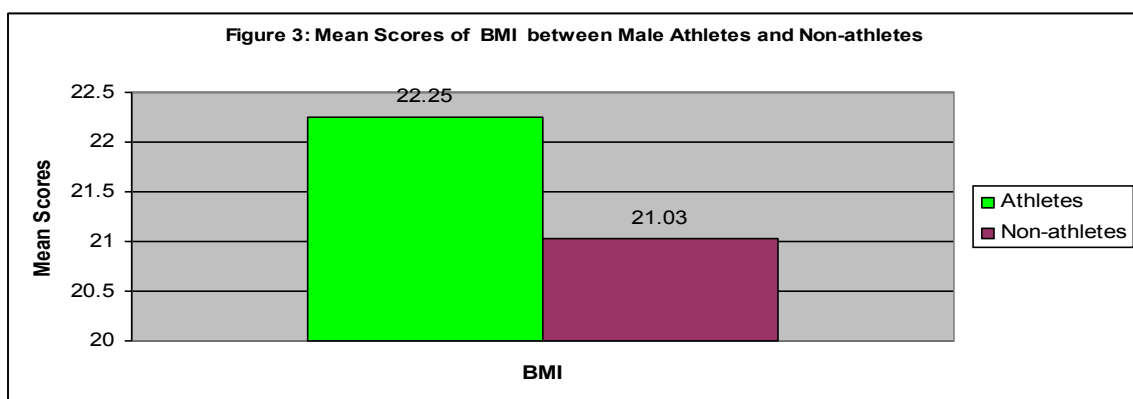
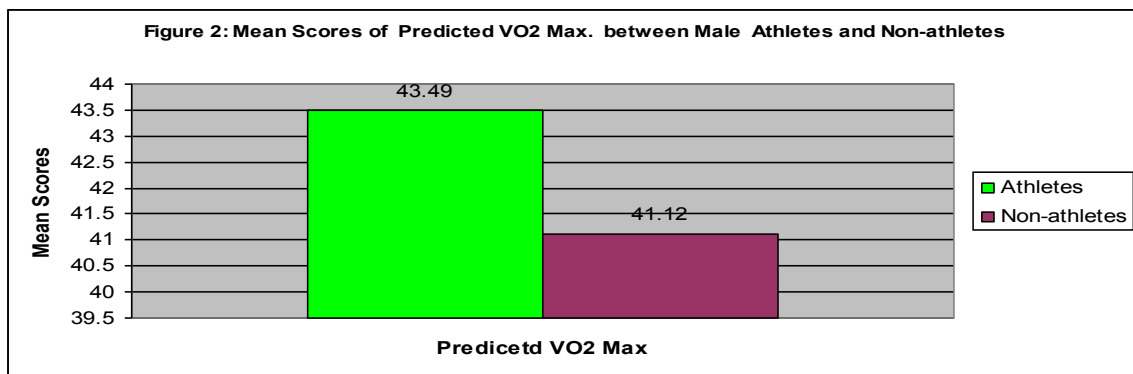
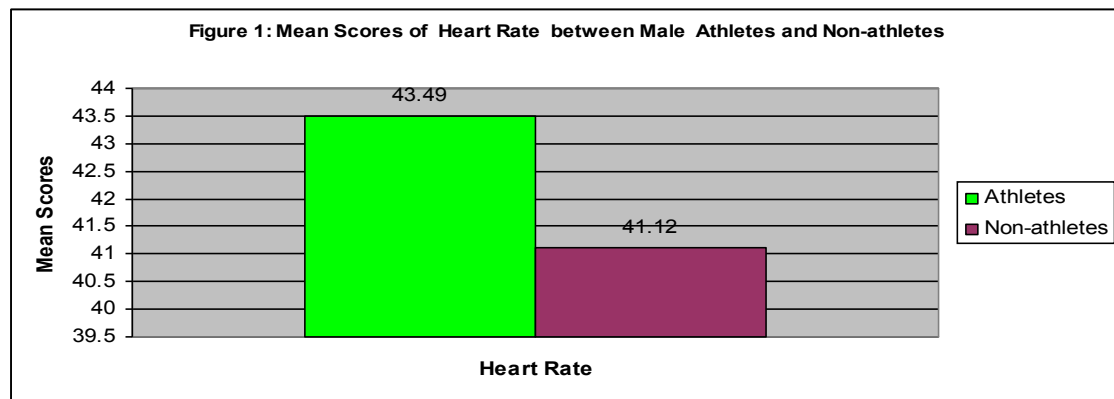
TABLE 3

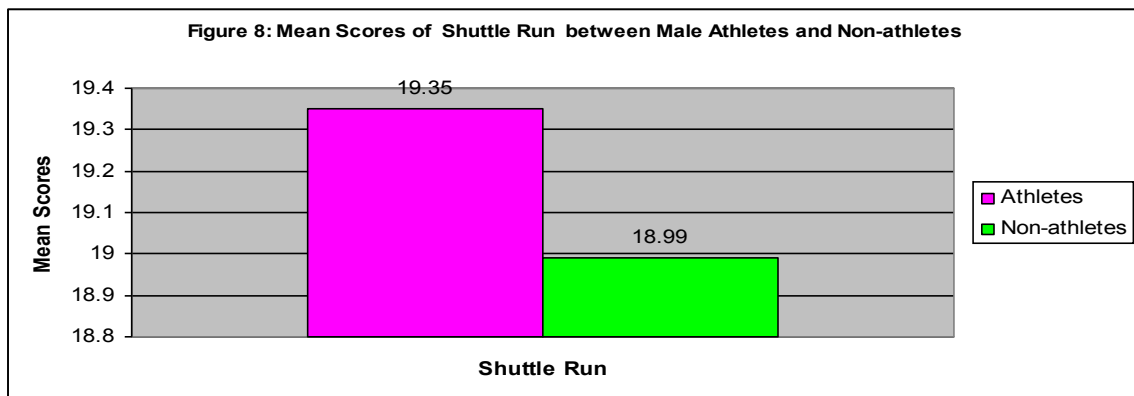
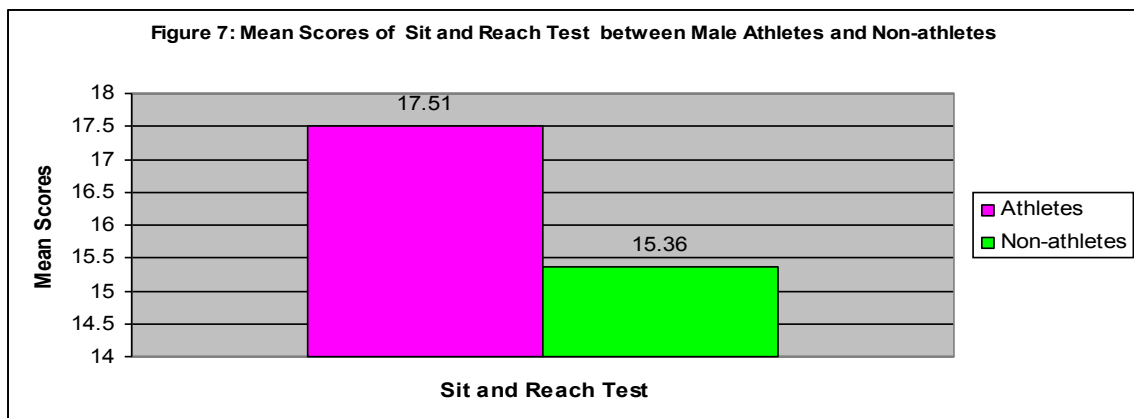
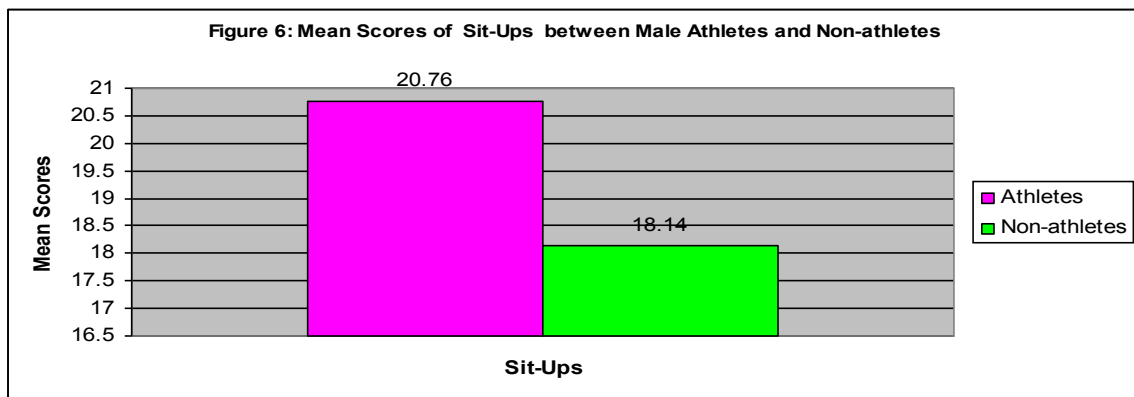
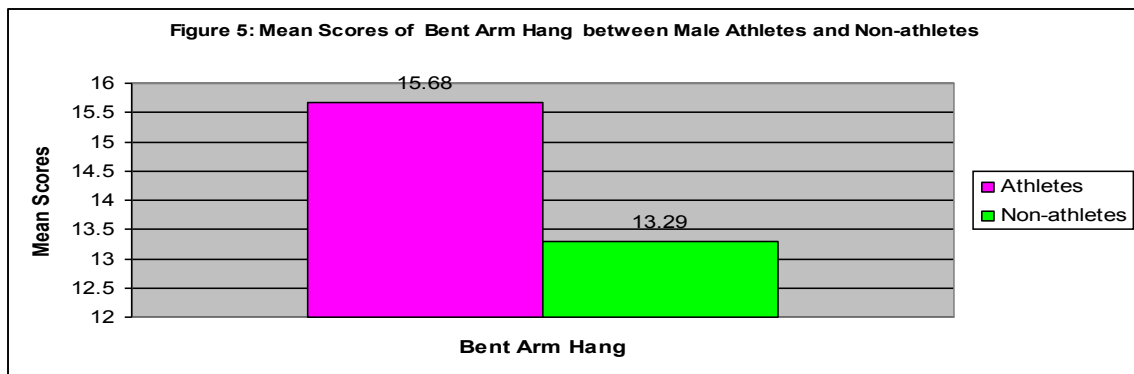
SIGNIFICANCE OF DIFFERENCE BETWEEN MEAN SCORES OF PHYSICAL FITNESS COMPONENTS OF MALE ATHLETES AND NON-ATHLETES

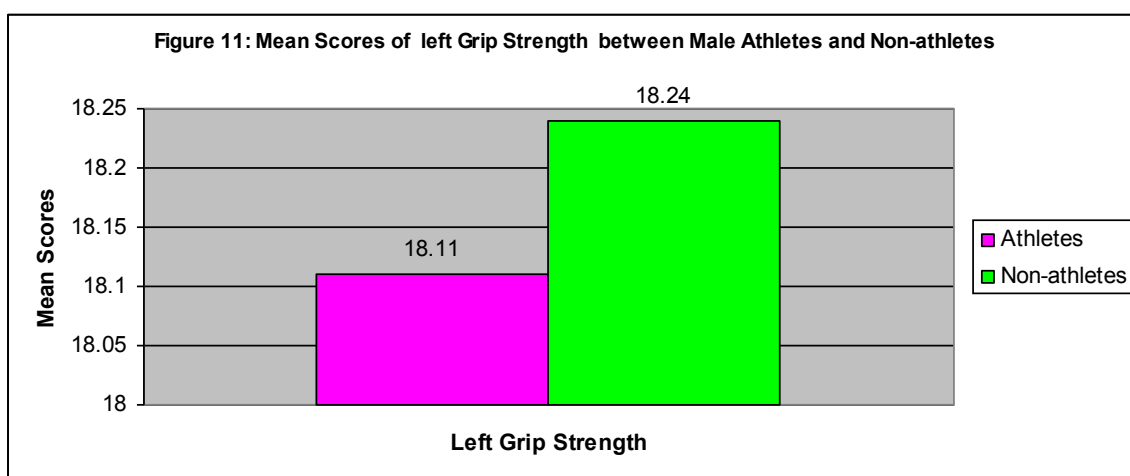
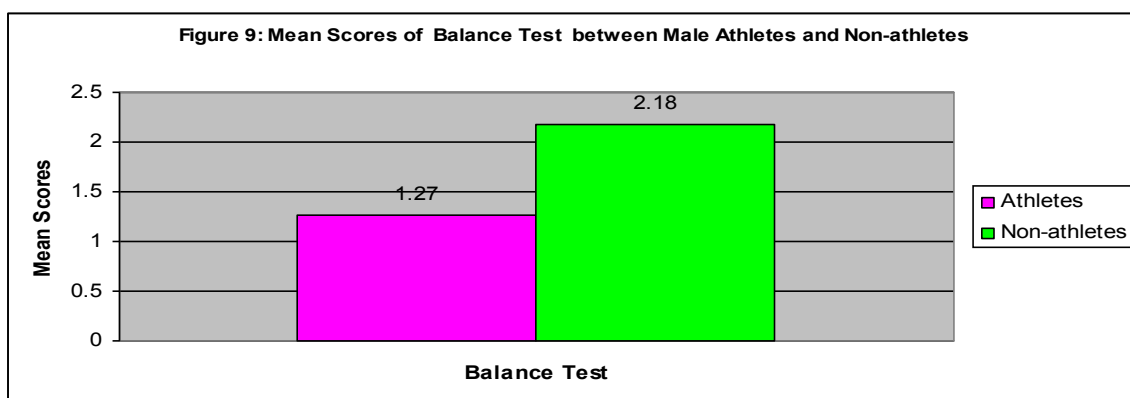
Variables	Groups	Mean	MD	σ_{DM}	t-ratio
Standing broad jump	Athletes	1.72	0.87	0.78	1.15
	Non-Athletes	2.59			
Bent arm hang	Athletes	15.68	2.39	2.08	1.49
	Non-Athletes	13.29			
Sit-ups	Athletes	20.76	2.62	0.98	2.67*
	Non-Athletes	18.14			
Sit and reach	Athletes	17.51	2.15	1.11	1.93
	Non-Athletes	15.36			
Shuttle run	Athletes	19.35	0.36	1.27	0.28
	Non-Athletes	18.99			
Balance	Athletes	1.27	0.91	0.78	1.16
	Non-Athletes	2.18			
Right grip strength	Athletes	22.12	0.77	1.39	0.55
	Non-Athletes	22.89			
Left grip strength	Athletes	18.11	0.13	0.99	0.13
	Non-Athletes	18.24			

*Significant at .05 level, $t_{.05(98)} = 1.98$

It is evident from Table 3, that the statistically significant difference was found between the means of sit-ups of male athletes and non-athletes, as the obtained t-value of 2.67 was higher than the required value of $t_{.05(98)}=1.98$. In case of standing broad jump, bent arm hang, sit and reach, shuttle run, balance, right grip strength and left grip strength components of physical fitness, statistically significant difference was not found between male male athletes and non-athletes, as the obtained t-values of 1.15, 1.49, 1.93, 0.28, 1.16, 0.55 and 0.13 respectively were less than required value to be significant.







DISCUSSION

The findings of this study relate to some physiological and physical fitness parameters. and demonstrate that Indian children living in Bilaspur are in some aspects similar to other populations studied. The high prevalence of normal weight found in this study has implications for the children's growth and development. The maximum oxygen uptake and heart rate of male athletes and non-athletes were also investigated to ascertain whether this phenomenon is linked with health status of school children.

CONCLUSIONS

1. Significant difference was not found between athletes and non-athletes in their heart rate, Cardiovascular endurance, BMI variables of physiological fitness.
2. Athletes did not have significant difference in comparison of non-athletes in their Explosive strength of leg, arm and shoulder strength, flexibility, agility, total body balance and , Explosive Strength of arm except Muscular strength & endurance of Abdomen and back parameters of physical fitness

RECCOMENDATION

1. It is recommended that growth and development profile should be established for children from different regions within each country
2. It is also recommended that the Central board of secondary Education Board, India should streamline action on the teaching of physical education and sports practice in

schools. This will reinforce the children's behaviour towards physical activity and sports. The modification of the behaviour risk lifestyle among children and youth can help foster a healthier future for an entire generation of people.

3.

BIBLIOGRAPHY

- Ram C.** "Comparative Study of physical qualities of offensive and defensive football athletes of college level", Unpublished Master Degree project, LNCPE Gwalior, 1977.
- Kaur D.** "Assessment of Physical fitness of high School girl of Punjab". Doctoral Thesis, Punjabi University, Patiala, 1990.
- Sidhu R. (1992)** "A Comparison of physical fitness of urban & rural secondary school female students " Unpublished M. Phil thesis Punjabi University , 1992.
- Singh, H.** Science of Sports Training, New Delhi: D.V.S. Publications., 1991, p. 15
- Harrison Clarke, H. & Clarke, H. David** Application of Measurement to physical Education 6th ed. (New Jersey: Prentice - Hall, Inc., Englewood Cliffs, 1987), p.8.
- Dishman, R. K., Washburn, R. A. & Heath, G. W.** Physical activity epidemiology. Champaign, Illinois: Human Kinetics, 2004.
- Alter, M.J.** Sport Strength. Champaign, Illinois: Leisure Press, 1990, American College of Sports & Medicine. (ACSM) 2005, Health-related physical fitness assessment manual. Baltimore: Lippincott Williams & Wilkins, pp. 3-86.