Journal of Education and Practice
ISSN 2222-1735 (Paper) ISSN 2222-288X (Online)
Vol.7, No.13, 2016


# Kinanthropometric Profile and Physical Performance of Athletic Track Events in Relation to Different Runners

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**Abstract**
The purpose of this study was to find out kinanthropometric profile of 20 Athletes of Middle distance 800 meters, & Long distance runners 5000 meters of Track Event of age 17 years were assessed for the present study. The data of athletes was collected at Athletics Summer Camp 2015 in Kashmir region. The Athletes having participation of at least two years were selected for the current study. All subjects were assessed for height, weight, girths, diameters, and skin fold thickness. The data was analyzed by applying descriptive statistic i.e., mean, standard deviation & t-test to find out the significant differences of/in middle distance and Long distance runners. The long distance runners had taller than long distance runners for standing height, upper leg length, and lower leg length. The middle distance runners 800 significantly greater in weight, skin fold measurements ($p<0.05$). In Body Girths and Skeletal Diameters no significant differences were found ($p>0.05$). It is concluded that in some of the parameters there were significant differences between middle distance & long distance runners Long distance runners athletes showed better kinanthropometric measurement.
**Keywords:** Kinanthropometry, Bodyweight, Height, Circumference Skinfold thickness.

## Introduction

Kinanthropometry is a useful tool in the hands of sports scientists, human biology, physical anthropologist, sports coaches and physical educationists for the study of athletes in different sport specializations (Singh and Malhotra, 1989). Kinanthropometric measurements are also used to determine body size differences, somatotyping and body composition.

The kinanthropometry of physical characteristics are known to be of fundamental importance for individual development to achieve high level of performance in a specific sport. Knowledge of kinanthropometry equips us with technique of various body measurements like weight, height, diameters, circumferences, skinfolds and sportsmen are selected on the basis of Studies on the physical characteristics of the human body till date indicate that the morphological characteristics of athletes successful in a specific sport differ in somatic characteristics from the general population. Each individual is unique in physical characteristics. Kinanthropometry examines the link between anatomy (structure) and performance (function) (MacDougall et al., 1982). Of physical characteristics for a particular sport (Singh & Malhotra, 1989).

Middle distance, & Long distance races which is an excellent track & field sports has been widely accepted as a highly competitive as well as recreational event all over the world. The sports performance is not a product of one single system. It is the product of the total physique of the sports person. (Tandon, 2001). Top level performance in particular Athletes event demands particular size of the body and shape. There was strong relationship between the structure of an athlete, and specific task. (De Garay, 1974) Many characteristics of the human body play major roles in the action of runners .The apparently simple skill of sprinting is actually dependent on an "athlete's ability to combine the actions of the legs, arms, trunk and so on into a smoothly coordinated whole" (Hay, 1993). As far as the runners characteristics are concerned, interrelationship of kinanthropometric profile and performance of the athletes remained less reportedly, especially in Indian context. The purpose of this study is to describe the kinanthropometric profile, of athlete's body composition. Skeletal diameters, length measurement, circumference, and Physical Performance of Athletic Track Events in relation to different runners.

## Methodology

The present study was conducted on 20 male athletes (800 meters middle distance runners N=10) and (5000 meters long distance runners N=10) of the age group of 17 years. The data of athletes was collected at Athletics Summer Camp 2015 in Kashmir region. The Athletes having participation of at least two years were selected for the current study.

Selection of subject, selection of variables, criterion measures, collection of data, administration of tests

 

and statistical technique, for the analysis of data, have been described.

**Sample**

The samples consisted of randomly selected 20 Athletes of the age group of 17 years.

| S.NO | ATHLETES FIELD EVENT | SAMPLE SIZE |
|---|---|---|
| 1 | 800 meters Middle distance runners | 10 |
| 2 | 5000meters Long distance runners | 10 |

**Variables**

**Tools used**

1. Height was measured by Anthropometric rod set to the nearest 0.5cm.

1. Height
2. Body weight
3. Length measurement
   (I) Leg length
   (ii) Upper leg length
   (iii) Lower leg length
4. Body Girths
   (I)Calf girth
   (ii)Thigh Girths
   ( iii)Hip Girths
5. Skeletal Diameters
   (I) Knee Diameters
   (ii) Ankle Diameter
6. Skin fold
   (I) Calf skin fold
   (ii) Thigh skin fold
   (iii) Abdomen

2. Body weight was measured by weighing machine to the nearest 0.5kg.
3. Girth was measured by non stretchable steel tape to the nearest 0.5 cm.
4. Skeletal Diameters was measured by sliding calliper.
5. Skin fold was measured by Harpendon skin fold caliper to the nearest 0.1mm.

**Statistical Analysis**

The relationship of kinanthropometric variables to athletic ability was established by computing descriptive statistics for each characteristic were calculated, Mean, Standard deviation, T-value. Data was analyzed using SPSS (statistical package for the social sciences, version 16.0).

**Results**

Mean, SD,& t-value of height, weight, leg length, upper leg length, lower leg length, thigh girth, calf girth, hip girth Knee Diameters, Ankle Diameters, thigh skin fold, calf skin fold, Abdomen skin fold , Table no:-1,2,3,4,5, respectively.

Table (1) **Physical characteristics of middle distance runners and long distance runners**

| Variables | Middle distance runner (800meters) | | Long distance runners (5000meters) | | t-value |
|---|---|---|---|---|---|
| | Mean | SD | Mean | SD | |
| Height(cm) | 164.2 | 8.96 | 165.2 | 9.21 | 0.808 |
| Body weight(kg) | 62.79 | 5.22 | 55.39 | 9.07 | 5.10*** |

p<0.05

Table (2) **Length measurement (cm) of middle distance runners and long distance runners**

| Variables | Middle distance runner (800meters) | | Long distance runners (5000meters) | | T-value |
|---|---|---|---|---|---|
| | Mean | SD | Mean | SD | |
| Upper leg length | 39.4 | 3.34 | 40.1 | 3.75 | 0.664 |
| Lower leg length | 40.4 | 2.72 | 40.8 | 2.35 | 0.729 |

p>0.05

Table (3) **Body Girths (cm) of middle distance runners and long distance runners**

| Variables | Middle distance runner (800meters) | | Long distance runners (5000meters) | | T-value |
|---|---|---|---|---|---|
| | Mean | SD | Mean | SD | |
| Thigh Girth | 43.4 | 5.08 | 46.8 | 6.19 | 0.196 |
| Calf Girth | 30.3 | 2.36 | 32.0 | 2.62 | 0.145 |

p>0.05

Table (4) **skeletal diameter (cm) of middle distance runners and long distance runners**

| Variables | Middle distance runner (800meters) | | Long distance runners (5000meters) | | T-value |
|---|---|---|---|---|---|
| | Mean | SD | Mean | SD | |
| Knee diameter | 11.97 | 0.68 | 12.41 | 1.41 | 0.385 |
| Ankle diameter | 9.4 | 0.46 | 9.6 | 1.45 | 0.682 |

p>0.05

Table (5) **skin fold (mm) of middle distance runners and long distance runners**

| Variables | Middle distance runner (800meters) | | Long distance runners (5000meters) | | T-value |
|---|---|---|---|---|---|
| | Mean | SD | Mean | SD | |
| Thigh Skin fold | 7.04 | 2.35 | 5.70 | 1.43 | 3.01** |
| Calf Skin fold | 6.82 | 2.09 | 2.94 | 2.46 | 1.966** |
| Abdomen Skin fold | 8.21 | 2.94 | 3.75 | 0.58 | 2.095** |

**Indicates p<0.05

**Discussion**

The result of the present study shows that the Middle distance runner and Long distance runners differed in weight, skin fold measurement with regard to their performance level. kinanthropometric profile can play a significant role in contributing to success in some sports by offering certain natural advantages.(Zaccangi,2001) physical characteristics of a sportsman has a tremendous influence on the performance level However, there can also be significant disadvantages posed by size and resultant mass that could prove to be a hindrance to success. But in Track and Field athletics, most of the events required a good height for better performance. (Terzis et al, 2010, Eiben, 1972, Tanner 1964)

The Middle distance runners possess significantly greater body weight, & skin fold measurement, the greater fat content in the body affect performance negatively. (Terzis et al, 2010, Morrow et al.1985) Height, Body Girths and Skeletal Diameters no significant difference were found. Body shape muscle strength, the relative lengths of legs, heels and toes as well as fine tuned nervous system to pull the whole thing together are just some of the biological attributes the make world class Track Athletes.

**Conclusion**

The following conclusions were drawn within the limitation of the present study.

The kinanthropometric profile of Athletes of Middle distance runner (800meters) had bigger than The Long distance runners (5000meters) for body weight & skin folds measurements. The Long distance runners insignificantly had taller than Middle distance runner for upper leg length, and lower leg length.

Hence, it could be concluded that kanthropometrical characteristics were one of most influential factors in determining good athletic Physical performances.

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