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Relationship of pace and selected physical variables in middle distance running

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Abstract

The purposive sampling technique was employed used For the purpose of this study 30 male athletes belonging to state and Inter-University level 800mts runners from sports hostel, stadium and Universities were selected as the subjects of the study. The age of the subjects ranged between 17-30 years. Researcher is find out the relationship of pace with selected Physical and Physiological variables in middle distance running Pearson's product moment correlation was applied and for predicting the 800 meters performance on the basis of selected physical and physiological variables, multiple regression analysis was employed. Level of significance was set at 0.05 level.

The mean and standard deviation for selected physical variables of 800mts runners were as follows: Height (131.57 ± 4.08 sec.), Fat percentage (12.25 ± 1.64), for Heart rate per minute, Pre-test (53.70 ± 3.94), Post-test (182.37 ± 7.31 ; for Blood lactate Pre-test (5.86 ± 0.86 m.mol/lit), Post-test (20.08 ± 2.89 m.mol/lit), Hemoglobin was ($14.76 \pm 1.28\%$) respectively.

Co-efficient of correlation of selected physical variables i.e. Standing Height is -0.083, Body Weight is -0.061, Percentage of Fat is -0.236. which is lesser than the required tabulated value. It indicates that there is no significant relationship of Standing Height, Percentage of Fat, and Body Weigh with the performance of 800mts runners. It indicates that there is no significant relationship of Standing Height with the performance of 800mts runners.

Keywords: Relationship of pace, physical variables, distance running

Introduction

Human beings by nature are competitive and aspire for excellence in all athletic performances. Not only every man but every nation wants to show his supremacy by challenging the other nations. Thus this challenge stimulates, inspires and motivates all the nations to sweat and strive, to run faster, to jump higher, throw further and exhibit greater strength, endurance and skill in the present competitive world of sports. Non ending creation of new records show a continuous upward trend and improvement in the standard of sports performance. The acquisition of new standards may be attributed to better understanding of the human organism in relation to physical and motor performance qualities under his success in the area of Exercise Physiology, Sports Psychology, Sports Biomechanics, Sports Medicine, Training Methods and other areas related to specific sports. The elevation of athletics is a recognition that is the sports of supreme endeavour, the sports where man pits himself not only against other man, but also against the limitations which nature has to imposed upon him, the sports where frontiers of human endurance are attained and surpassed. Athletics is the basic sport for all and so it has assumed great importance in recent years. Research in nutrition, psychology, biochemistry and physics have contributed much to the improvement of performance level of athletics in various competitive sports of today. In recent years the sports scientists have taken interest in the analysis of human movement in various sports activities making use of the laws of physics. Man as a moving living body obeys the scientific laws of the universe. (Seidal and Pesiek, 1972) ^[1].

Methodology

The purposive sampling technique was employed used For the purpose of this study 30 male athletes belonging to state and Inter-University level 800mts runners from sports hostel,

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stadium and Universities were selected as the subjects of the study. The age of the subjects ranged between 17-30 years. Keeping in mind the feasibility criteria and the specific purpose of the present investigation, the Physical variables i.e. Standing height, Body weight and Fat percentage were found appropriate for investigation. In order to find out the relationship of pace with selected Physical and Physiological

variables in middle distance running Pearson’s product moment correlation was applied and for predicting the 800 meters performance on the basis of selected physical and physiological variables, multiple regression analysis was employed. Level of significance was set at 0.05 level.

Results

Table 1: Descriptive analysis of selected physical and physiological variables of subjects

| S.N | Variables (Unit) | Experimental Conditions | Mean (M) | S.D. (σ) | Minimum | Maximum | Range |
|-----|---------------------------|-------------------------|----------|-------------------|---------|---------|-------|
| 1. | HEIGHT (cm) | | 172.70 | 4.98 | 165.00 | 182.00 | 17.00 |
| 2. | WEIGHT (kg) | | 64.27 | 7.04 | 54.00 | 78.00 | 24.00 |
| 3. | PERFORMANCE of 800m (sec) | | 131.57 | 4.08 | 125.00 | 138.00 | 13.00 |
| 4. | FAT percentage (%) | | 12.25 | 1.64 | 9.00 | 15.50 | 6.50 |
| 5. | HEART RATE (NO) | Pre- Test | 53.70 | 3.94 | 48.00 | 61.00 | 13.00 |
| | | Post- Test | 182.37 | 7.31 | 172.00 | 196.00 | 24.00 |
| 6. | BLOOD LACTATE (m.mol/lit) | Pre- Test | 5.86 | 0.86 | 4.20 | 7.40 | 3.20 |
| | | Post- Test | 20.08 | 2.89 | 14.50 | 24.50 | 10.00 |
| 7. | HEMOGLOBIN (%) | | 14.76 | 1.28 | 12.70 | 17.50 | 4.80 |

The mean and standard deviation for selected physical and physiological variables of 800mts runners were as follows: Height (172.70 ± 4.98 cm), Weight (64.27 ± 7.04 kg), Fat percentage (12.25 ± 1.64%), Heart rate per minute, Pre-test (53.70 ± 3.94), Post-test (182.37 ±

7.31; for Blood lactate Pre-test (5.86 ± 0.86 m.mol/lit), Post-test (20.08 ± 2.89 m.mol/lit), Hemoglobin was (14.76 ± 1.28%) respectively.

Descriptive profile of selected Physical and Physiological variables are presented in figure-1.

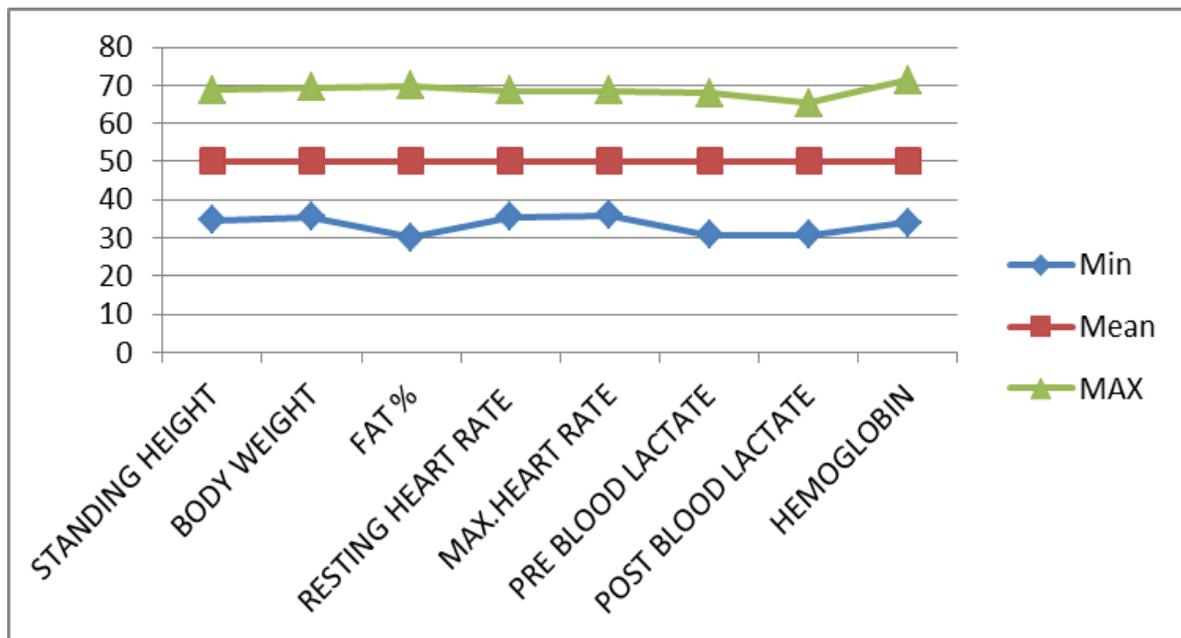


Fig 1: Descriptive profile of selected physical and physiological variables

Table 2: Co-efficient of correlation of selected physical variables with the performance of 800mts runners

| S. No. | Variable(Unit) | Mean (M) | Standard Deviation | Co-efficient of Correlation (r) |
|--------|---------------------|----------|--------------------|---------------------------------|
| 1. | Standing Height(Cm) | 172.70 | 4.98 | -0.083 |
| 2. | Body weight (Kg) | 64.27 | 7.04 | 0.061 |
| 3. | Fat percentage (%) | 12.25 | 1.64 | -0.236 |

* Significant at 0.05 level $r_{0.05}(28) = 0.361$

It was evident from table -2 that co-efficient of correlation of selected physical variables i.e. Standing Height is -0.083, which was not significant at 0.05 level of significance with 28 degree of freedom. As the coefficient of correlation -0.083 which is lesser than the required tabulated value 0.361. It indicates that there is no significant relationship of Standing Height with the performance of 800mts runners. Co-efficient of correlation of Body Weight is -0.061, which

was not significant at 0.05 level of significance with 28 degree of freedom. As the coefficient of correlation 0.061 which was lesser than the required tabulated value 0.361. It indicates that there is no significant relationship of Body Weight with the performance of 800mts runners.

Co-efficient of correlation of Percentage of Fat is -0.236, which was not significant at 0.05 level of significance with 28 degree of freedom. As the coefficient of correlation -0.236

which is lesser than the required tabulated value 0.361. It indicates that there is no significant relationship of Percentage of Fat with the performance of 800mts runners.

Discussion

Standing height

The standing height of the 800m runner where co-relation with there 800m running performance. The Statistical finding so obtain revealed the fact that there is no significance relationship of standing height with the performance of 800m runners Statistical in significant may be attributed to the fact that 800m Performance depend primarily on pace and muscles ability to utilized energy and generate tension, ability to consume larger volume of Oxygen. Not only standing height but there are other causative factors like sitting height, leg length etc. also contribute for 800m running performance. Through, standing height is an important factor for stride length of an athlete which is a contributory factor of speed of an athlete but in present research in significant relationship was obtained may be due to smaller sample size, level of participation of the athlete and many others performance indicators of 800m running.

Fat percentage

The Percentage of fat when co-related with 800m running performance it was observed that the coefficient of co-relation 0.061 which was not significant at 0.05 level with 28 degree of freedom the Statistical insignificant pertaining to fat Percentage revealed the fact that Percentage fat do not have any relationship with 800m running performance in present investigation. However intensive review of related literature revealed the fact that a sound theoretical base exists for believing that excess body fat is detrimental to performance. Adipose tissue mainly serves the purpose of energy storage. It is noncontractile and cannot assist in force generation. Yet it has mass and weight, which increases the force generation requirement of the muscles for support of body segments against gravity and to overcome inertia during acceleration. According to newton's second law, force equal mass times acceleration, so that acceleration equals force divided by mass.

For an individual with given amount of muscles tissue and force generation capability, fat deposits increase the mass and thus the weight and inertia of body segment 10% increase in the object mass reduces acceleration by 9%.

Body fat percentage reduces the rate at which the body can be accelerated, as when speed or direction is rapidly changed.

It can be seen that the relationship between percentage fat and running performance in not strong. The relatively weak association between percentage body fat and 800m running performance indicates an individual's running ability cannot be well predicted by fatness.

There are many fatter individuals who can ever faster than leaner ones and many lean individual who do not run as fast as expected. Thus, it can be inferred from the statistical findings that mean percentage fat is 12.25 which is comparably lesser than the lean body weight, so is no relationship shown between fat percentage and 800m performance.

Conclusions

Following conclusions were finally drawn

1. There is no significant relationship of Standing Height with the performance of 800mts runners.
2. There is no significant relationship of Percentage of Fat

with the performance of 800mts runners.

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