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Analysis of Biomotor Performance in Sprinters and Long–Distance Runners

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Abstract: *The purpose of the present study was to see the comparative difference between the selected Bio motor variables among Sprinters and Long distance male Athletes. To achieve the objective of the study 30 state level male Athletes (15 sprinters and 15 Long distance runners) were selected as subjects by using purposive sampling technique. The age of the subjects ranged between 18 – 20 years. The study was limited to selected Bio motor variables namely Explosive power and Reaction time. The data were recorded by different measures namely Standing broad jump, 10 metre lying start. To compare the bio motor variables among Sprinters and Long distance Athletes t – test was used with the data analysis software SPSS and significant was set at 0.05 level of confidence. The finding of a study revealed that there is an significance difference between Sprinters and Long distance Athletes.*

Keywords: Bio motor, Explosive power, Reaction time.

I. INTRODUCTION

In today's world, sports are crucial. It matters to a person, a community, a country, and the entire planet. People of all ages and genders find the word "sports" appealing. A large portion of the appeal of athletics is from the diverse range of experiences that arise from involvement, happiness, agony, success, failure, exhaustion, pain alleviation, and a sense of community. May glorious prestige, goodwill, tragedy, grief, and even death are all possible outcomes of sports. The amount of time you spend playing sports has expanded along with your leisure time in Thrift culture. However, only few compete at the Olympic or elite levels. There are a lot more people who play at the local or community levels since sports participation benefits spectators, among other things.

The sport of participating in track and field competitions, such as running races and different jumping and throwing contests. Running is among the most popular sports in the world. The incredibly rapid growth of enthusiasts who transition from competitive to recreational activities is indicative of this. People can participate in a variety of running events, including sprint, middle-distance, long-distance, road race, race walking, cross-country running, and marathon running, which contributes to the sport's broad appeal. Different training plans and physical characteristics, such as sprinters and middle distance runners, will arise from the diversity in the number of running competitions.

The Olympic distance categories are 100, 200, and 400 meters, while athletic parents select the World Athletics sprint number division up to 400 meters. A running sprint takes less than a minute, while a 100-meter run takes about ten seconds. Sprinting is the capacity to cover a short distance quickly. It is used in many sports involving running. typically to quickly reach a goal or destination or to avoid or capture an adversary. Human physiology states that a runner cannot maintain their near-top speed for more than 30 to 35 seconds due to the depletion of muscle phosphocreatine reserves, which may be a result of severe metabolic acidosis brought on by anaerobic glycolysis.

An athlete who competes in running events over long distances, particularly marathons, is referred to as a "long-distance runner". A long-distance runner is a person who:focuses on long-distance competitions (5 km to ultra-marathons) trains to improve mental toughness, speed, and endurance for difficult distances maintains endurance and controls speed to finish half-marathons, marathons, 10,000-meter races, and more. Long-distance running is more than just a physical struggle; it's a mental and emotional adventure that tests endurance, patience, and determination. It

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requires careful energy management to reach the finish line. The emphasis is on timing and consistent effort rather than just speed.

Statement of the problem

The purpose of the present investigation was to compare the selected Bio motor variables of the subjects.

Hypothesis

It was hypothesized that they may be a significant difference in selected Bio motor variables of the subjects.

Delimitation

1. The study was delimited to male athletes only.
2. The study was delimited to thirty (N-30) athletes only.
3. The study was delimited only to compare selected Bio motor variables among sprinters and Long distance runners.
4. The study was delimited to age between 18yrs to 20 years of state level male athletes.

Limitations of the study

1. Life style of the athletes will not be considered in this study.
2. Environmental factors will be considered.
3. Socio economic status of the players will not be considered.
4. Emotional background will be not considered.

II. DEFINITIONS OF TERMS

1. **Bio motor** :Biomotor skills are the biological functions that are employed throughout any type of physical activity.
2. **Variables** : The traits of factors that change from one case or condition to another. The representations of the traits usually in quantitative form, such as a measurement or as enumeration.
3. **Reaction time**:It is defined as the length of time taken for a person (or) system to respond to a given stimulus or event. Reaction time is amount of time taken it takes to respond to a stimulus.
4. **Explosive Power**:The ability to exert a maximal force in as short a time as possible, as in accelerating jumping, and throwing implements while strength is the maximal force you can apply against a load, power is proportional to the speed in which you can apply this maximal force.

III. REVIEW OF RELATED LITERATURE

Milanovic et al., (2013) determined the effects of a 12 week conditioning programme involving speed, agility and quickness (SAQ) training and its effect on agility performance in young soccer players. Soccer players were randomly assigned to two groups: experimental group (EG; n = 66, body mass: 71.3 ± 5.9 kg; body height: 1.77 ± 0.07 m) and control group (CG; n = 66, body mass: 70.6 ± 4.9 kg; body height: 1.76 ± 0.06 m). Agility performance was assessed using field tests: Slalom; Slalom with ball; Sprint with 90° turns; Sprint with 90° turns with ball; Sprint with 180° turns; Sprint with backward and forward running; Sprint 4 x 5 m. Statistically significant improvements ($p < 0.05$) between pre and post training were evident for almost all measures of 42 agility, with and without the ball, with the exception being the Sprint with backward and forward running. This suggests that SAQ training is an effective way of improving agility, with and without the ball, for young soccer players and can be included in physical conditioning programmes.

Mujika, Santisteban and Castagna (2009) examined the effects of 2 in season short-term sprint and power training protocols on vertical countermovement jump height (with or without arms), sprint (Sprint-15m) speed, and agility (Agility-15m) speed in male elite junior soccer players. Twenty highly trained soccer players (age 18.3 +/- 0.6 years, height 177 +/- 4 cm, body mass 71.4 +/- 6.9 kg, sum skinfolds 48.1 +/- 11.4 mm), members of a professional soccer academy, were randomly allocated to either a Contrast (n = 10) or Sprint (n = 10) group. The training intervention

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consisted of 6 supervised training sessions over 7 weeks, targeting the improvement of the players' speed and power. Contrast protocol consisted of alternating heavy-light resistance (15-50% body mass) with soccer-specific drills (small-sided games or technical skills). SPRINT training protocol used line 30-m sprints (2-4 sets of 4 x 30 m with 180 and 90 seconds of recovery, respectively). At baseline no difference between physical test performance was evident between the 2 groups ($p > 0.05$). No time x training group effect was found for any of the vertical jump and Agility-15m variables ($p > 0.05$). A time x training group effect was found for Sprint-15m performance with the Contrast group showing significantly better scores than the Sprint group (7.23 +/- 0.18 vs. 7.09 +/- 0.20 m/s, $p < 0.01$). In light of these findings Contrast training should be preferred to line sprint training in the short term in young elite soccer players when the aim is to improve soccer-specific sprint performance (15 m) during the competitive season.

Chandra shekaran(2012) Identified the components of motor fitness that enhance playing ability in both high- and low-achieving state football players. 150 participants between the ages of 20 and 25 from various Tamil Nadu districts were chosen at random. They had to pass a fitness test that measured their speed, agility, explosive power, and cardiovascular endurance. Playing skill is solely dependent on physical health and a stress-free mentality, according to statistical analysis of the data collected both before and after the tournament. Furthermore, playing games more successfully is correlated with social level.

IV. METHODOLOGY

The purpose of the present investigation was to compare the Bio motor variables among sprinters and Long distance runners.

In order to achieve this purpose 30 athletes from Bengaluru who have represented state level and were selected the subjects is in the age group of 18-20 years. These samples were tested with 2 selected bio motor variables.

The variables were as follows (Bio motor variables)

VARIABLE TEST

1. Explosive power - Standing broad jump,
2. Reaction time - 10 metre lying start

Descriptive of tests

A brief description of tests is explained below.

Standing broad jump :(Explosive power)

Purpose

To measure the athletes power of the legs in jumping forward.

Equipment's:

A measuring tape and suitable sand pit.

Procedure

With the feet parallel to each other and behind the starting mark, the performer bends the knees and swings the arms and jumps as far as possible

Scoring

The number of inches (mts) Between the starting line and the nearest heel upon landing, the three trails are permitted and then the best trail is recorded as the score.

10m lying start :(Reaction time)

Purpose

To assess the reaction time

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Equipment's:
10 metre running on a track and stop watches.
Personnel administering test were used for the purpose

Procedure
The test was administered on all the subjects one after one the subjects should take lying position in starting line and at the command " On Your Mark" "Set" " Whistle", the subject started immediately and stopped when the subject crosses the finishing line.

Scorning
Scoring was recorded to the nearest on tenth of a second

V. ANALYSIS AND INTERPRETATION OF DATA

STATISTICALLY TECHNIQUES
The following statistical procedure were followed to find out the Bio motor variables among sprinters and Long distance runners of Athletes.
The data collected was the subject to statistical analysis by using mean and the standard deviation.
The 't' ratio and the analysis were applied to examine the data. The 't' ratio was calculated to find out the significant difference among sprinters and Long distance runners of Athletes.

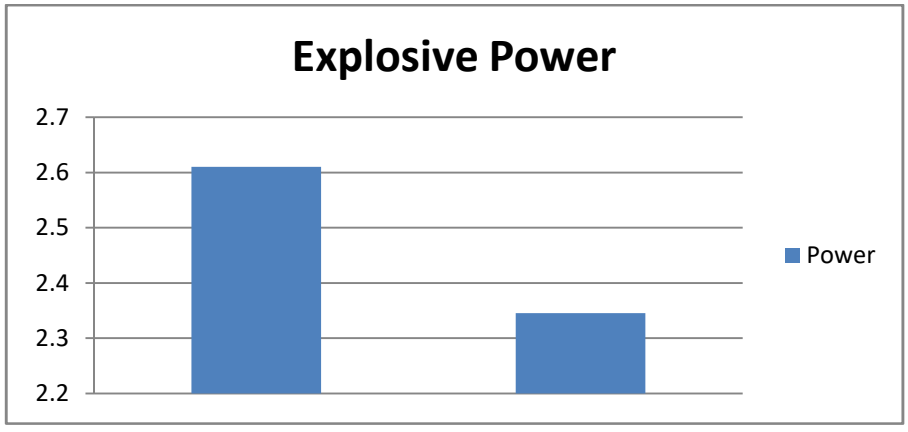
Explosive power
The number of subjects, mean value, standard deviation, and 't ratio between different Independent variables for among sprinters and long distance runners of DYES sports hostel Bengaluru are shown for " power" as the variable

TABLE 1

S l no	Names	N	Mean	S D	T ratio
1	Sprinters	15	2.61	0.06897	
2	Long distance	15	2.345	0.13824	**3.37673**

*** Significant at 0.05 level**
In explosive power the sprinters are better more power than long distance runners of DYES sports hostel Bengaluru. The 't' ratio was found to be **3.37673** at 0.05 level of confidence. It was found to be significant.

GRAPH 1: Figure showing the variation in the Mean values of sprinters and middle distance runners of Explosive power are shown in graph.



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10 MTS LYING START

The number of subjects, mean value, standard deviation, and t-ratio among sprinters and long distance runners of DYES sports hostel Bengaluru are shown for 10m lying start as the variable.

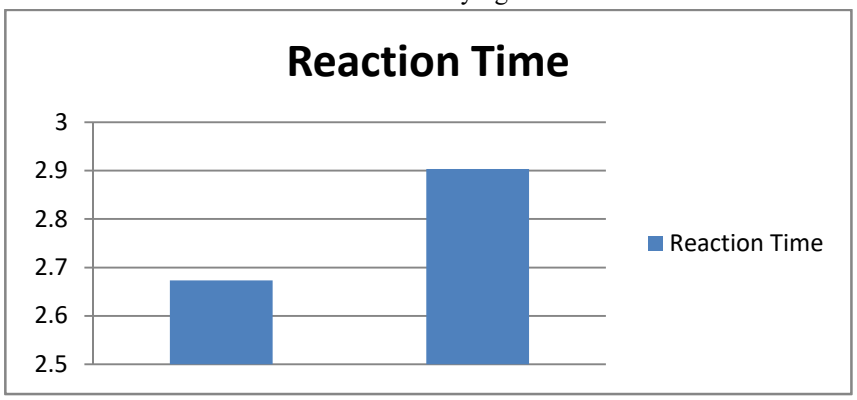
TABLE -2

Sl. No.	Groups	N	Mean	Standard Deviation	T-ratio
1	Sprinters	15	2.686	0.111534	
2	Long distance	15	2.9033	0.07178	**3.34652**

Significant at 0.05 level

In 10m flying start the sprinters are better than long distance runners of DYES sports hostel Bengaluru. The 't' ratio was found to be3.34652 at 0.05 level of confidence ,It was found to be significant.

GRAPH -2: Figure showing the variation in the Mean values of sprinters and long distance showing DYES sports hostel for 10m lying start.



VI. SUMMARY, CONCLUSION AND RECOMMENDATIONS

SUMMARY

The purpose of the study was to compare and analyse the variations in selected Bio motor variables among sprinters and Long distance runners of Athletes.

The present study was conducted on 30 men subjects selected from state level Athletes Bengaluru.

The age of the subjects were running from 18-20.

The research scholar had gone through the scientific literature pertaining to the analysis of Bio motor variables from different sources and also concluded the experts in these areas along with said literature and expert opinion. The administrative feasibility in terms of availability of instruments and expertise for meaning and recording of data was also given due consideration while selecting Bio motor variables. Based on the above mention criteria following variables are selected.

The Bio motor variables were measured by administering test namely Standing broad jump to assess Explosive power, 10m lying start to assess Reaction time.

VII.CONCLUSION

It was found from the analysis that

1 In Explosive power sprinters are better than the long distance runners. The significance difference is seen in speed when compared with table value.

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5. In Reaction time the sprinters were better than long distance runners. The significance difference is seen in speed when compared with table value.
6. The study shows that, sprinters better in all Bio motor variables when compared to long distance runners of the present study.

VIII. RECOMMENDATIONS

While concluding this study the researcher felt certain related avenues for further research.

1. The findings of the study showed that the similar study may be conducted on the other Athletes also.
2. Investigation may be made on the other components which were not taken in this study.
3. The study may be conducted at higher levels.
4. Standard playing equipment and facilities should be provided to the athlete.
5. There should be regular organization of tournaments, coaching camps etc…, at the college level.

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