ANALYSIS OF PERFORMANCE FACTORS OF TRACK AND FIELD ATHLETES

AN ABSTRACT

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ABSTRACT

INTRODUCTION

Track and field athletics has got many events with different types of requirements in respect of body build, motor fitness, psychological makeup and other performance factors. So, there have been lot of research works in this area to identify pre-qualities and specialties of each of these areas. But still research has required to find out the differences among the difference groups of activities such as running, jumping and throwing in respect of their performance factors, may be body build, motor fitness, psychological makeups and so on. Thus, the present study was stated as **"ANALYSIS OF PERFORMANCE FACTORS OF TRACK AND FIELD ATHLETES"**.

The purpose of the present study was: I. To compare the selected physical, motor fitness and psychological parameters of different track and field athletes. II. To observe the relationship of selected physical parameters, selected motor fitness and selected psychological parameters with best performance of different track and field athletes. III. Analysis of performance factors with selected physical, motor fitness and psychological parameters of different track and field athletes.

METHODOLOGY

Total number of thirty (30) male players were selected from each group such as sprinters, long jumpers, and javelin throwers. Age ranged from 14 to 20 years. The data for present study was collected from West Bengal athletic meet 2017 to 2019.

For the study three different criteria were conducted. These are:

Physical Parameters:

I) Age - On the basis of their birth certificate

II) Height (cm) –Stadiometer

III) Weight (kg) - Weighing machine

IV) Best Performance – Sports achievement

Motor fitness parameters:

I) 50-meter dash (Second) – To measure the sprinting ability

II) SBJ (Meter) – To measure leg explosive strength

III) Shuttle Run (4x10 yard) – To measure the agility

IV) Nelson hand reaction test (Second) – To measure the reaction ability

V) Jonson and Nelson speed pass co-ordination test (Second) – To measure Coordination

Psychological Parameters:

I) Sports competition Anxiety: measured by standardized questionnaire (Martens et al. 1990)

II) Attitude: measured by standardized questionnaire (Harold M, Barrow and Rosemary McGee, 1979)

III) Personality Hardiness: measured by standardized questionnaire (Singh, 2008)

Statistical Procedure: The obtained data in form of digital score was treated statistically to get results and to draw conclusions. The mean and SD were considered as descriptive statistics. ANOVA was employed to find out significant difference. Post- hoc test was employed to calculate the pair wise comparisons between the groups. Multiple correlation and Multiple regression were employed as relationship and predictive statistics.

THE RESULTS

Analysis of data leads to the following results.

A. Physical parameters:

I. Height and weight did not show any significant relation with performance, but height and body weight show positive relation with performance of three difference groups.

II. Analysis of inter-group variation in these parameters indicated that there was no significant difference between three difference groups

B. Motor fitness parameters:

I. Results indicated that performance of sprinters had significant correlation with speed and agility. Long jumpers exhibited significant correlation of performance with leg

explosive strength. Javelin throwers group exhibited no significant correlation of performance with motor fitness.

II. Regression analysis indicated that the performance of sprinters exhibited 50.9% dependence on motor fitness; performance of long jumpers exhibited 22.7% dependence on motor fitness and performance of javelin throwers exhibited only 15.1% dependence on motor fitness.

III. Analysis of inter-group variation in different selected motor fitness components indicated that sprinters group was significantly better than both the groups of long jumpers and javelin throwers in speed as well as agility and reaction time. But the differences between long jumper and javelin throwers groups in case of reaction time were not statistically significant.

IV. Long jumpers group showed significantly better in leg explosive strength than both the other groups – the sprinters and javelin throwers. The difference between sprinters and javelin throwers groups was also statistically significant.

V. In coordination the javelin throwers group was found to be significantly better than both of sprinters and long jumper's groups. The difference between sprinters and long jumper's groups was also statistically significant.

C. Psychological Factors:

I. The group of javelin thrower exhibited significantly lesser sports competitive anxiety than both groups of sprinters and long jumpers. But the sprinters and long jumper's groups were not statistically significant in this factor.

II. Second psychological factor was attitude. The sprinters group was found to be significantly higher than the groups of javelin throwers. But the difference between sprinters and long jumpers and also long jumpers and javelin throwers groups was not statistically significant in this factor.

III. The third psychological factor was personality hardiness. This component was analyzed into its four dimensions – commitment, control, challenge, and personality hardiness. Analysis of inter-group difference indicated that there was no statistically significant difference in these dimensions.

IV. Analysis of relationship between performance and selected psychological factors sexhibited that there was significant positive relation of personality hardiness with performance for long jumper's group. In personality hardiness the sprinters and javelin throwers groups exhibited positive correlation. In the sprinters and javelin throwers groups also exhibited positive correlation for all psychological factors with performance.

V. Regression analysis indicated that the performance of sprinters exhibited 5.9% dependence on psychological factors; performance of long jumpers exhibited 28.8% dependence on psychological factors and performance of javelin throwers exhibited only 19.5% dependence on psychological factors.

DISCUSSION OF THE RESULTS

As per the result of the study there was no statistical difference among selected groups of athletes- Sprinters, Long jumpers and Javelin throwers in selected parameters height and weight.

This may be due to the fact that all groups of performers within same age ranged and the basic element require for this track and field event are also similar.

Regarding motor fitness the sprinter group was found significantly better than the other two groups- long jumpers and javelin throwers. This results also supported by Harpreet Singh (2018). This may be due to the fact that the sprinting speed is the dominant factor for sprinting.

The long jumpers group was found to be significantly better than other two groups- sprinters and javelin throwers. Similar results also suggested by Norjali Wazir, M. R. W., Samsu, R., Yaacob, A., Martuan, S. Z. and Ishkandar, C. D. M. (2022). This may be due to fact that leg explosive strength most dominant motor fitness factor in running long jump.

The coordination ability was found to be significantly better for javelin thrower than other two groups. This may be due to fact that the technique of javelin throw requires more coordination because of involvement of approach running and throwing actions.

Psychological factors:

In the present study SCAT, Attitude and Personality hardiness are analyzed. The result indicated that the sprinters and long jumpers' group had higher sports competitive anxiety

than the javelin groups. Similar results have been reported by Aneesh Rajappan, Dr. V. A. Manickam, (2016). This may be due to the fact that the sprinting performance is more uncertain and risk oriented. In sprinting there is a single chance to complete the event in comparison with 6 trials in javelin throw.

In Attitude sprinters group was found to be significantly higher than the javelin thrower groups. This may be due to the fact that sprinting requires more attention and involvement for the events than the events if throwing.

The results indicated that all the three groups- sprinters, long jumpers and javelin throwers exhibited positive correlation with the selected psychological parameters- SCAT, Attitude and Personality hardiness.

The regression analysis indicates that the performance for sprinter and javelin throwers groups had 54.2% dependence on selected psychological factors.

CONCLUSION

On the basis of the results and findings of the study the following conclusions are drawn-

A. Physical parameters – height and weight were the selected factors in this group.

   I. Height and weight did not show positive but not significant relation with performance.

   II. Analysis of inter-group variation in these parameters indicated that there was no significant difference between three different groups.

B. Motor fitness parameters – speed, leg explosive strength, agility, reaction time and coordination were the selected parameters in this group.

   I. Results indicated that performance of sprinters had significant correlation with speed, agility and reaction time. Long jumpers exhibited significant correlation of performance with leg explosive strength. Javelin throwers group exhibited no significant relation of performance with motor fitness.

   II. Regression analysis indicated that the performance of sprinters exhibited 50.9% dependence on motor fitness; performance of long jumpers exhibited 22.7% dependence on motor fitness and performance of javelin throwers exhibited only 15.1% dependence on motor fitness.

III. Analysis of inter-group variation in different selected motor fitness components indicated that Sprinters group was significantly better than both the groups of long jumpers and Javelin throwers in speed as well as agility and reaction time. But the differences between long jumper and javelin throwers groups in case of reaction time were not statistically significant.

IV. Long jumpers group showed significantly better in leg explosive strength than both the other groups – the Sprinters and Javelin throwers. The difference between Sprinters and Javelin throwers groups was also statistically significant.

V. In coordination the Javelin throwers group was found to be significantly better than both of Sprinters and Long jumper's groups. The difference between Sprinters and Long jumper's groups was also statistically significant.

C. Psychological Factors – Sports competitive anxiety, attitude and personality hardiness were the selected psychological factors.

I. The group of Javelin thrower exhibited significantly lesser sports competitive anxiety than both groups of Sprinters and Long jumpers. But the Sprinters and Long jumper's groups were not statistically significant in this factor.

II. Second psychological factor was attitude. The sprinters were significantly higher than Javelin throwers in Attitude. But the difference between sprinters and long jumpers and also long jumpers and javelin throwers groups was not statistically significant in this factor.

III. The third psychological factor was personality hardiness. This component was analyzed into its four dimensions – commitment, control, challenge and personality hardiness. Analysis of inter-group difference indicated that there was no statistically significant difference in four of these dimensions – commitment, control, challenge, and personality hardiness.

IV. Analysis of relationship between performance and selected psychological factors exhibited that there was significant positive relation of personality hardiness with performance for long jumper's group. In personality hardiness the sprinters and javelin throwers groups exhibited positive correlation. In the sprinters and javelin

throwers groups also exhibited positive correlation for all psychological factors with performance.

V. Regression analysis of psychological factors with performance indicated that the sprinters group had 5.9% dependence on these factors for performance. The long jumpers group exhibited 28.8% dependence and the javelin throwers group had 19.5% dependence with the psychological factors with performance.

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