

A Study of Relationship between Selected Psychological and Physiological Variables of Long Distance Runners and Long Jumpers of Nagpur District of Maharashtra

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Abstract – The present study has been conducted with aim to find out relationship between psychological and physiological variables of long distance runners and long jumpers among senior secondary schools of Nagpur District and their age varied from 16 to 18 years. For this study, Anxiety and Achievement Motivation were selected as psychological variables whereas Resting Pulse Rate and Breath Holding Time were selected as Physiological variables and administrated to 50 Long distance runners and 50 Long Jumpers by using various standardized tests developed for these selected variables. The analyses of data were done by various statistical techniques discussed in the study. The result clearly indicates that there is significant relationship between psychological and physiological parameters.

1. INTRODUCTION

Today, sports are an integral part of education. Moreover, education without sports is incomplete. Keeping their value in life, children are taught some sorts of games in the very early stage in school. These days' sports are a part of academic curricula. Sports are particularly important for the youth. They help in their physical and mental growth. They contribute in the form of character. They inculcate in them good values. It is therefore, sports competition is held at school and college levels and sports have great value in life.

No matter what sport you play, you are bound to have better health than people who avoid sports. No other active is as productive in gaining endurance, strengthening of muscles and overall fitness as sports. To attain a fit body and pleasing and attractive personality, you need to play sports. When we are playing, we actually utilize our free time in doing something good. Infact, parents who scold their kids for playing, instead of mugging up books in afternoons, must realize that the kid gains nothing from disinterested studying, while they gain good health and better psyche from games. Playing increases sharpness of mind and mental strength. Sport teaches you how to handle failures with dignity, while enjoying victories to the maximum.

Also, it trains people to handle crunch situations, where stress can try and pull them down. All positive traits for healthy mind and a healthy personality can be gained from sports.

In addition to the above, self-confidence is boosted by excelling in sports and while trying to excel, discipline becomes a part of life. Anyone who takes sports seriously knows the importance of discipline and determination to succeed. He also becomes dedicated and responsible, in turn, becoming more successful and confident. Most of the popular games are team events and those played individually also have team versions. Playing team games makes a person more comfortable with others. It improves the interpersonal skills and makes a person efficient as a team player. He generates positive vibes that help him to work in any scenario with different people, who have different senses and sensibilities. Thus, Their physical and physiological strength becomes an important aspect of their overall development. In the backdrop of above information this investigation has been carried out to determine the relationships between selected physiological factors like resting pulse rate and breath holding time and psychological factors like anxiety and achievement motivation of long distance runners and long jumpers of the Nagpur District.

2. METHODOLOGY

In this study, a total of 100 male athletes (long distance runners and long jumpers) were selected. Out of this 50 were long distance runners and remaining 50 were long jumpers from senior secondary school of Nagpur District of Maharashtra. The age of subjects varied from 16 to 18 years.

2.1 Design of the Study

In the present study a random group design was adopted.

2.2 Collection of Data

In view of the various methods available for data collection, in this study the primary data related to research criterion and objective of the study was collected by using a combination of survey and experimental methods.

2.3 Criterion measures

Based on the role of psychological and physiological aspects related to the running and jumping events, and with the discussion of experts and scholar's own understanding, following variables were selected for the purpose of the study. In the study the Anxiety and Achievement Motivation were the psychological parameters and resting pulse rate and breath holding time were the physiological parameters.

2.3.1 Anxiety Test:

Anxiety of the long distance runners and long jumpers was determined using CA- Test developed by Dr. R.L. Bhardwaj, Dr. H. Sharma, and Dr. M. Bhargava.

2.3.2 Achievement Motivation test:

Achievement motivation of the subjects was assessed using Achievement Motivation test developed by V.P. Bhargava

2.3.3 Resting Pulse Rate:

The measurement of resting pulse rate (the number of heart beats per minute) was taken after a few minutes upon waking whilst still lying on the ground. The subjects were asked to lie down for at least 10 minutes before taking a measurement. The measurements were made by taking radial pulse measurement (at the wrist). The pulse rate was counted by palpating the left radial artery with the fingertips to count the pulse per minute using stop watch.

2.3.4 Breath Holding Time (Seconds):

In this study, the breath holding time in seconds was recorded by following manual method. For recording the breath holding time, a stop watch (1/10th of second) and nose clip were used. The time is

recorded in seconds and better of the two trails is recorded.

2.4 Reliability and Validity of Data

All the standard methods as well as instruments were used for data collection in the present study. The reliability and validity of the research instrument was determined prior to actual data collection. The tester's reliability was evaluated together with the reliability of tests. A person's product moment correlation was computed between the two measures of each variable.

2.5 Statistical Treatment of Data and Significance Level

The data generated during the study was processed using various statistical tests with the aid of Statistical Package for Social Science 18.0 software. The data characteristics such as mean, standard deviation, standard error, minimum, maximum, skewness, kurtosis, frequency, percentage etc. were determined. The relationship between psychological and physiological parameters was determined using Pearson product moment correlation coefficient method. The significance level was chosen to be 0.05 (or equivalently, 5%)

3. RESULTS AND DISCUSSION

3.1 Anxiety of Players

Table 1: Descriptive Statistics for the Anxiety Parameter

| Statistics | Players | |
|--------------------|-----------------------|--------------|
| | Long Distance Runners | Long Jumpers |
| Mean | 32.5 | 48.9 |
| Standard deviation | +4.9 | +6.8 |
| Standard Error | 1.3 | 2.7 |
| Minimum | 23 | 32 |
| Maximum | 42 | 60 |
| Skewness | 0.958 | 1.067 |
| Kurtosis | 1.232 | 1.309 |

Above Table 1 presents descriptive statistics pertaining to the comparative assessment of anxiety level of long distance runners and long jumpers. The skewness values for long distance runners were 0.958 whereas, for the long jumpers were 1.067 respectively. Furthermore, The Kurtosis values for long distance runners were 1.232 whereas for the long jumpers were 1.309. The low Skewness and kurtosis values indicated that the data was appropriate for further statistical treatment.

3.2 Achievement Motivation of Players

Table 2: Descriptive Statistics for the Achievement Motivation Parameter

| Statistics | Players | |
|--------------------|-----------------------|--------------|
| | Long Distance Runners | Long Jumpers |
| Mean | 24.9 | 20.7 |
| Standard deviation | +2.6 | +3.1 |
| Standard Error | 1.2 | 1.5 |
| Minimum | 19 | 16 |
| Maximum | 28 | 24 |
| Skewness | 0.846 | 1.037 |
| Kurtosis | 0.594 | 0.873 |

Above **Table 2** presents descriptive statistics pertaining to the comparative assessment of achievement motivation level of long distance runners and long jumpers. The skewness values for long distance runners were 0.846 whereas, for the long jumpers were 1.037 respectively. Furthermore, The Kurtosis values for long distance runners were 0.594 whereas for the long jumpers were 0.873. The low Skewness and kurtosis values indicated that the data was appropriate for further statistical treatment.

3.3 Resting Pulse Rate of Players

Table 3: Descriptive Statistics for the Resting Pulse Rate Parameter

| Statistics | Players | |
|--------------------|-----------------------|--------------|
| | Long Distance Runners | Long Jumpers |
| Mean | 61.8 | 69.8 |
| Standard deviation | 4.5 | 6.1 |
| Standard Error | 1.6 | 2.1 |
| Minimum | 55 | 62 |
| Maximum | 68 | 76 |
| Skewness | 0.957 | 0.844 |
| Kurtosis | 1.097 | 1.239 |

Above **Table 3** presents descriptive statistics pertaining to the comparative assessment of Resting Pulse Rate of long distance runners and long jumpers. The skewness values for long distance runners were 0.957 whereas, for the long jumpers were 0.844 respectively. Furthermore, The Kurtosis values for long distance runners were 1.097 whereas for the long jumpers were 1.239. The low Skewness and kurtosis values indicated that the data was appropriate for further statistical treatment.

3.4 Breath Holding Time of Players

Table 4: Descriptive Statistics for the Breath Holding Time Parameter

| Statistics | Players | |
|--------------------|-----------------------|--------------|
| | Long Distance Runners | Long Jumpers |
| Mean | 34.2 | 24.9 |
| Standard deviation | 3.9 | 4.8 |
| Standard Error | 1.2 | 1.9 |
| Minimum | 24 | 18 |
| Maximum | 43 | 34 |
| Skewness | 1.008 | 1.374 |
| Kurtosis | 0.984 | 1.036 |

Above **Table 4** presents descriptive statistics pertaining to the comparative assessment of Breath Holding Time of long distance runners and long jumpers. The skewness values for long distance runners were 1.008 whereas, for the long jumpers were 1.374 respectively. Furthermore, The Kurtosis values for long distance runners were 0.984 whereas for the long jumpers were 1.036. The low Skewness and kurtosis values indicated that the data was appropriate for further statistical treatment.

3.5 Relationship between psychological and physiological parameters

Table 5: Relationship between psychological and physiological parameters- Long Distance Runners

| | Correlation Coefficient (r ²) | |
|---------------------|---|------------------------|
| | Anxiety | Achievement Motivation |
| Resting Pulse Rate | 0.542** | 0.294 |
| Breath Holding Time | -0.379* | -0.534** |

*: significant at p<0.05

** : significant at p<0.01

Above **Table 5** presents results regarding the relationships between psychological and physiological parameters of long distance runners.

- **Resting Pulse Rate:** The study results indicated that there is significant positive relationship between resting pulse rate and anxiety (r²=0.542), p<0.01). Although resting pulse rate was positively related to achievement motivation, the relationship was not significant (r²=0.294), p=Not Significant).
- **Breath Holding Time:** The study results indicated that there is significant negative relationship between Breath Holding Time and Anxiety (r²=-0.397,p<0.05) and achievement motivation (r²= -0.534,p<0.01)

3.6 Relationship between psychological and physiological parameters

Table 6: Relationship between psychological and physiological parameters- Long Jumpers

| | Correlation Coefficient (r^2) | |
|---------------------|-----------------------------------|------------------------|
| | Anxiety | Achievement Motivation |
| Resting Pulse Rate | 0.607** | 0.103 |
| Breath Holding Time | -0.464* | -0.427* |

*: significant at $p < 0.05$
 **: significant at $p < 0.01$

Above **Table 5** presents results regarding the relationships between psychological and physiological parameters of long jumpers.

- **Resting Pulse Rate:** The study results indicated that there is strong positive relationship between resting pulse rate and anxiety ($r^2=0.607$), $p < 0.01$) and weak positively relation with achievement motivation ($r^2=0.103$), $p = \text{Not Significant}$).
- **Breath Holding Time:** The study results indicated that there is significant negative relationship between Breath Holding Time and Anxiety ($r^2=-0.464$, $p < 0.05$) and achievement motivation ($r^2=-0.427$, $p < 0.05$)

4. CONCLUSIONS

4.1 Relationship between Psychological and physiological parameters- Long Distance Runners

- On the basis of study results it is concluded that there is significant positive relationship between psychological parameter and physiological parameter (Resting Pulse rate) of long distance runners whereas there is significant negative relationship between Psychological Parameter and physiological parameter (Breath Holding Time) of Long distance runners.

4.2 Relationship between Psychological and physiological parameters- Long Jumpers

- On the basis of study results it is concluded that there is significant positive relationship between psychological parameter and physiological parameter (Resting Pulse rate) of long Jumpers whereas there is significant negative relationship between Psychological Parameter and physiological parameter (Breath Holding Time) of Long Jumper.

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