Relationship of Selected Physiological Variables with 50 M Free Style Swimming Performances of Junior Boys of Delhi

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Abstract

Aim: The purpose of the research article was to find out the relationship of selected physiological variables (Vital Capacity and Breathe Rate) with 50m free style swimming performance of junior boys of Delhi. The data was collected on 30 junior boy's swimmer of Delhi. **Objective:** The objective of the research article was to find out the relationship of selected physiological variables(Vital Capacity and Breathe Rate) with 50m free style swimming performance of junior boys of Delhi. **Statistical Tools:** Descriptive statistics were computed for the collected data and Pearson Product Moment Correlation was used to find out the relationship of selected physiological variables (Vital Capacity and Breathe Rate) with 50m free style swimming performance. The level of significance set was 0.05. **Result:** The result of the research article revealed that there were significant and inverse relationships of selected physiological variables(Vital Capacity and Breathe Rate) with 50m swimming performance of junior boys of Delhi.

KEYWORDS – Vital Capacity, Breathe Rate, 50m Freestyle Swimming, Descriptive statistics and Pearson Product Moment Correlation

INTRODUCTION

It is perhaps evident that there is a growing realization of importance of physiological variables enhancing the human health and performance. Therefore, physiological variables such as anaerobic power, vital capacity, resting heart rate, respiratory rate, lean body weight, body fat percentage and breathe holding capacity received special consideration and it is an important pre-requisite for outstanding performance in sports.

Swimming performance is influenced by biomechanical, physiological and psychological factors. The biomechanical factors include swimming speed, stroke mechanics, startsamd turning ability. The physiological factors include aerobic capacity, anaerobic power and capacity, muscle power and flexibility. Psychological factors of motivation and stress management are also critical at the elite level of competition **(Noakes, T. D. 2000 and Smith, D. J. et.al. 2002)**. The aim of the coach is to train, adapt and improve the swimmer's ability in order to maximize the swimmer's level of competitive performance. The initial focus is to train the swimmer to withstand the physiological and psychological stresses of training required to prepare for the major competitions. Sport scientists monitor and evaluate the swimmer's performance during competitions. Sport scientists monitor and evaluate the swimmer's performance during competition and training to quantify changes in fitness and performance. This quantification and evaluation provides short- and long-term feed back to the coach and the swimmer. In competition, performance is typically assessed by analysing the race final and split times, technical components and strategy. In the training environment the scientist measures performance times,

stroke mechanics and physiological markers. A major goal for the scientist is to provide objective information complementary to the subjective observations of the coach. Meaningful inferences about the data that is collected require detailed treatment of the reliability of measurements, precision of estimated changes and differences in performance and fitness, as well as reference values for interpreting these changes with respect to performance outcomes**(Mujika I. et.al. 1995)**.

Swimming is a sport which relies heavily on technique for optimal performance. For this reason, and the fact that it is performed in the water, monitoring swim performance is difficult. Monitoring, or keeping a record of progression or regression is important to coaches because it allows them to determine either successful or unsuccessful training techniques. It is also a good motivational tool for the swimmer. Currently, most monitoring techniques are done in the water simply through competition and recording times of performances. This procedure does not necessarily predict performance. A good performance cannot determine whether another performance in several weeks or months will be an improvement or not. However, recording times does monitor a swimmer's progress or regress. A test that involves sustaining a maximum power which can be accomplished out of the pool and has the ability to both monitor and predict a swimmer's performance throughout the season would be valuable to the coach and athlete in assessing potential and improvements in swimmers.

Swimming differs from many sports in a number of ways. First, it is one of the few sports where athletes compete in events that differ in both distance and technique **(Stewart, A. M. and W. G. Hopkins 2000)**. Swimming includes events involving four different strokes (freestyle, breaststroke, butterfly and backstroke) and an individual medley, where the one swimmer undertakes all in a predetermined order. Competitive pool swimming events are contested over distances ranging from 50 to 1500 m. these events are typically divided into sprint (50 and 100 m), middle distance (200 and 400 m) and distance (800 and 1500 m) categories. These classifications differ from the physiologically based definitions used in other sports. For example in running, sprint events are typically classified as 100 to 400 m distances; middle distance as 800 to 5000 m and distance as 10000 m up to a marathon.

Second competitive swimming is reliant on high rates of energy turnover, with the percentage contribution of the anaerobic systems decreasing as the event distance increases. In the shortest sprint events in swimming (50 m freestyle and form stroke), which last only 22 to 30 seconds, the predominant energy systems are the high-energy phosphate and anaerobic glycolysis. In contrast, aerobic glycolysis is the predominant energy system used in the longest distance pool swimming event of 1500 m lasting 14-16 minutes. Success in competitive swimming is simply defined as the shortest time required propelling the swimmer's body over a given distance in the water **(Miyashita, M. 1996)**. A combination of technique and exceptional physiological attributes are required for successful swimming.

PROBLEM STATEMENT

The objective of the present study was: To find out the relationship of selected physiological variables (Vital Capacity and Breathe Rate) with 50m free style swimming performance of junior boys of Delhi

METHODOLOGY

Selection of Subjects

For the purpose of the present study 30 junior boys were selected. The purpose of the study was explained to the subjects who in turn agreed voluntarily to undergo the testing programme were selected as subjects for the study.

Criterion measures

The following were the criterion measures chosen for the study:

a. Vital Capacity was measured with the help of Dry Spirometer.
b. Breathe Rate was measured with the help of stop watch.
c. 50m freestyle swimming performance was measured with the help of timings in 50m freestyle in seconds.

Statistical analysis

Descriptive statistics were computed for the data collected and Pearson product moment correlation was used to find out the relationship of selected physiological variables (Vital Capacity and Breathe Rate) with 50m freestyle swimming performance.

FINDINGS

The data collected from the junior boys (swimmers) of Delhi on vital capacity, breathe rate, and 50m freestyle event of swimming. The results depicting mean and standard deviation of vital capacity,breathe rate, and 50m freestyle event of swimming has been documented in table-1.

Table: 1. Descriptive Statistics for Vital Capacity, Breathe Rate, and 50m Freestyle Swimming Performance of Junior Boys of Delhi

Variables	Mean	Standard Deviation	N
Vital Capacity (ml)	2561.17	125.43	30
Breathe Rate (in numbers)	25.60	5.52	30
50m Freestyle Performance (in seconds)	32.33	2.92	30

Table 1 clearly indicates that the mean scores of vital capacity, breathe rate, and 50m freestyle performance were 2561.17, 25.60, and 32.33 respectively. Further table 1 also indicates the standard deviation values of vital capacity, breathe rate, and 50m freestyle performance were 125.43, 5.52, and 2.92 respectively.

Graphical representation of Mean and Standard Deviation values of vital capacity, breathe rate, and 50m freestyle performance were shown in figure number 1 to 3.

Fig.-1:Mean and Standard Deviation values for Vital Capacity of Junior Boys of Delhi

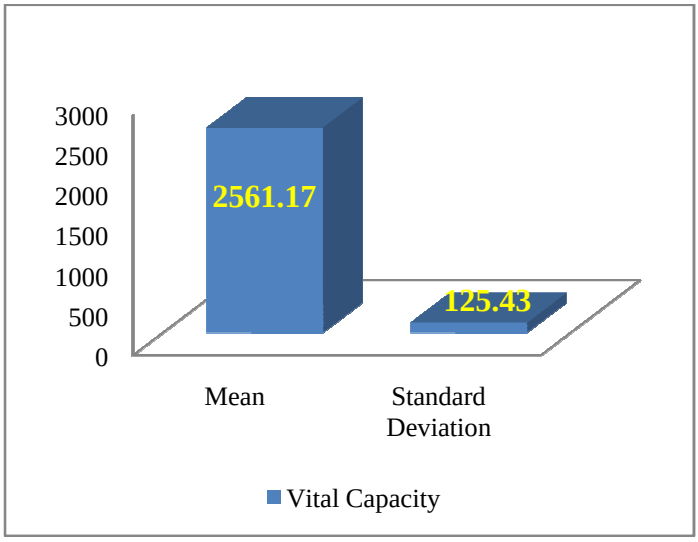

Fig.-2:Mean and Standard Deviation values for Breathe Rate of Junior Boys of Delhi

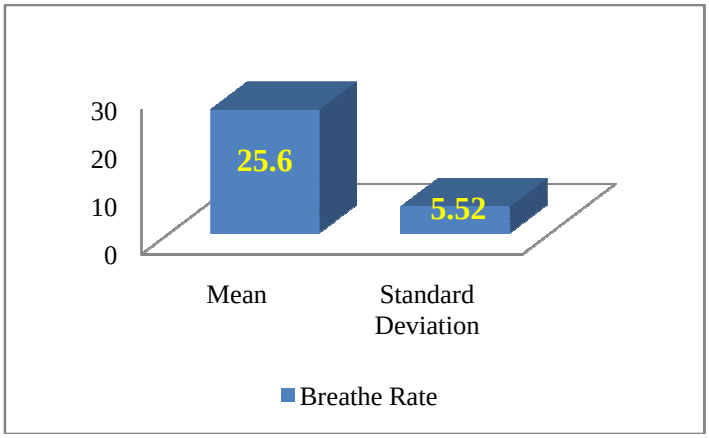

Fig.-3:Mean and Standard Deviation values for 50m Freestyle Swimming Performance of Junior Boys of Delhi

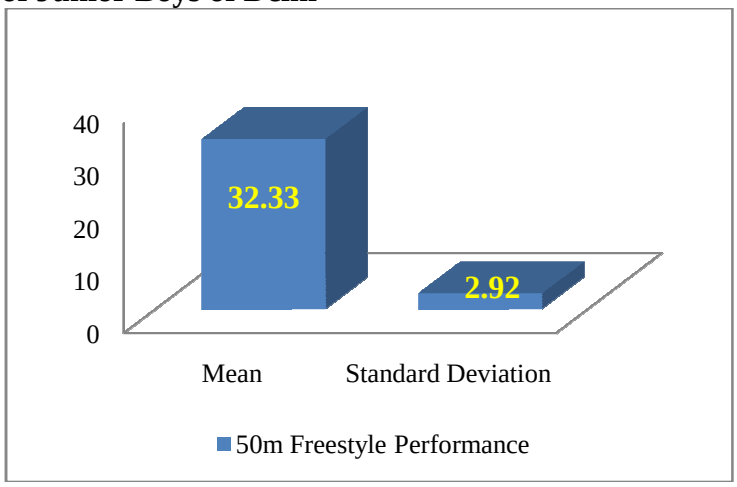

Table: 2. Relationship of vital capacity, breathe rate, with 50m freestyle swimming performance of junior boys of Delhi.

Variables	Calculated Values of Product Moment Correlation (r)
Vital Capacity with 50m freestyle performance	**- .937****
Breathe rate 50m freestyle performance	**- .978****

**** Significant at 0.01 level of significance.**

Table No. 2 indicates the calculated values of product moment correlation vital capacity and breathe rate with 50m freestyle performance of junior boys of Delhi. Further, it is evident from the above table that there were significant and inverse relationships of vital capacity and breathe rate with 50m freestyle performance. It means if an individual have highervital capacity and breathe rate then individual complete 50m freestyle event in less time or in other words we can say if an individual have higher vital capacity and breathe rate then individual perform better in 50m freestyle event.

DISCUSSION OF FINDINGS

The result of the study clearly indicates that there were strong correlations of vital capacity and breathe ratelengths with 50m freestyle performance.

CONCLUSIONS

On the basis of the present study the following conclusions are drawn:

- There was significant and inverse relationship between Vital Capacity and 50m freestyle performance junior boys of Delhi.
- There was significant and inverse relationship between Breathe Rate and 50m freestyle performance of junior boys of Delhi.

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