

A Study on Physiological Characteristics of National Volleyball Players

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Abstract

The purpose of the study was to determine the Physiological variables of National Volleyball Players. Study was conducted on twenty volleyball spikers from various regions of railways which participated in National railways Volleyball Championship. Twenty spikers from different teams were selected for the present study. The age of the subjects ranged from 18 to 25 years. Based on literary evidence and scholar's own understanding the following variables were selected for the purpose of this study: Physiological Variables Resting heart rate, Resting respiratory rate, Vital Capacity, Total body fat percentage, Lean body weight. Pulpatory method (Pulse rate count) was used to measure the Resting Heart Rate. Score was recorded in numbers of pulse per minute. Resting respiratory rate was measured by manual method over a period of one minute. Weight was recorded nearest to half a kilogram. Height was recorded to the nearest centimeter. Total Body fat percentage was measured by skinfold caliper and with help of Slown Weir Nomogram Technique score was recorded in percentage. To characterize Volleyball players by their selected physiological variables to standard human performance measures, descriptive statistics was used.

Key words: Spiker, Resting heart rate, Resting respiratory rate, Vital Capacity, Total body fat percentage, Lean body weight, Pulpatory method, Skinfold caliper, Slown Weir Nomogram Technique

INTRODUCTION

Sports by their nature are enjoyable, challenging and absorbing, and require a certain amount of skills and physical condition[1]. In the order of human values conquest in field of sports hold a unique plane. It is the combination of success, victory, triumph and domination of mover other team mates and friends. The sublimity of competition is in the loser's acclaim for the winners, which along with the friends and shake acknowledge both defeat and triumph[2]. Athletes for superior performance in any sports are selected on the basis of his fitness physical structure and body size, which has proved to be appropriate for high performance in the given sports[3].

[1] Dineash Seten et al, **Basic Book of Sports,** (England Cliffs, N.J. Hall, Inc., 1956), p.1.
[2] German Rieckehoff, **The Purpose of Sports**, Olympic Review 118 August 1977:471.
[3] J. M. Tanner, **The Physique of the Olympic Athletes** (London: George Allen and Unwin Ltd; 1964), P. 13.

The game of Volleyball offers opportunities for the development of strength, endurance, speed, agility, and neuro-muscular skills and immediate action along with many precise educational outcomes. The game of volleyball requires a conditioning programme, which develops flexibility, muscular strength, power and agility all of which must be integrated to achieve the optimum skill performance from each player[4].

Scientists and physiologists have been of the view that physical components of an athlete have a lot to do with the performance, more than the techniques and tactics of a player of a team. The research findings show that a high level of technical perfection alone has nothing to do with the success in competitive sports. Most of the game demands a greater amount of speed, strength, endurance, flexibility, co-ordination and maximum fitness of the organism[5].

Thus to spot out the gaps and subsequently bridge them the researcher in the form of present study is making modest effort in this direction to prepare the anthropometrical and physiological characteristics of national level volleyball players.

Objective of the study

The purpose of the study was to determine the Physiological characteristics of National Volleyball Players.

Delimitations

I. The study was delimited to the male volleyball spikers only.
II. Out of various physiological variables available in the literature the study was further delimited to the following physiological variables resting heart rate, resting respiratory rate, vital capacity, total body fat percentage and lean body weight.

Hypothesis

[4] **Encyclopedia or Sports Science and Medicine**, Ed S.V Volleyball by Arne L. Olson.
[5] Warren R. Johnson And E.R. Huskirk, " **Science and Medicine of Exercise and Sports**", (New York : Harper And Bros. Publication, 1974) p. 76.

Based on evidence available in the literature and on the basis of personal experiences, as well as discussion with experts, the following hypothesis was formulated.

It was hypothesized that means Anthropometrical and Physiological variable of National Volleyball Players will be distinct in nature

Significance of the Study

I. The study may throw light on the physiological characteristics of the men volleyball players.
II. The study may help to compare with the other players of the same level.
III. It may help to develop simple statistic in selecting the players.
IV. It may help the coaches and trainees to get an idea of the present performance level of the trainees.

Methodology

Selection of Subjects

The present study was conducted on twenty volleyball spikers from various regions who participated in National Railways Volleyball Championship. Subjects for this study were selected purposely and then randomly for the present study. The age of the subjects ranged from 18 to 25 years.

Selection of Variables

The study was taken to pinpoint the Physiological variables. Therefore, based on literary evidence and scholar's own understanding the following variables were selected for the purpose of this study:

Physiological Variables

1. Resting heart rate
2. Resting respiratory rate
3. Vital capacity

4. Body composition
    - Total body fat percentage
    - Lean body weight

Collection of Data

At the beginning, the investigator gathered all the subjects of volleyball of and explained the purpose of the present study to them. Necessary instruction was passed on to the subject before the administration of each test. Confidentiality of response was guaranteed. The required data in different components was collected during the course of three days in the volleyball field of (DLW, railways National 2011). The coaches and subjects were consulted personality and their sincere co-operation was solicited. Respondents were called to a common place when they were not busy and had enough time to spare for testing. Necessary instructions were given to the subjects before the administration of each test. The research motivated the student respondents by promising to send a separate abstract of conclusions of his study to each of the subject would not common flag their real feelings.

Criterion Measures

The criterion measures chosen were:

I. Pulpatory method (Pulse rate count) was used to measure the Resting Heart Rate. Score was recorded in numbers of pulse per minute.

II. Resting respiratory rate was measured by manual method over a period of one minute.

III. Positive breath holding was measured by manual method and the score was recorded in second.

IV. Negative breath holding was measured by manual method and the score was recorded in second.

V. Weight was recorded nearest to half a kilogram.

VI. Height was recorded to the nearest centimeter

VII. Total Body fat percentage was measured by skin fold calipers and with help of Slown Weir Nomogram Technique score was recorded in percentage.

Statistical Techniques

To find the characteristics of selected physiological variables of volleyball spikers, Descriptive statistics has been applied.

Level of significance was chosen as 0.05.

Findings

Table – 1

Physiological Variables	***Resting Respiratory Rate***	***Resting Heart Rate***	***Lean body weight***	***Body fat (%)***	***Vital Capacity***
Units	(breath/ minutes)	(beats/minute)	(kg.)	(mm.)	(Liters)
Mean	14.6	60.2	68.68	13.6	4
S. D.	1.8	2.37	4.127	1.09	0.2
Median	15	60	70	14	4
Mode	15	58	70	14	4
Sample Variance	3.25	5.62	17.03	1.19	0.1
Kurtosis	-0.68	-0.77	-0.95	0.19	0.9
Skewness	-0.46	0.42	-0.47	-0.69	0.9
Range	6	8	12.5	4	0.9
Minimum	11	57	62	11	3.6
Maximum	17	65	74.5	15	4.5
Standard Error	0.41	0.54	0.947	0.25	0.1

Table - 1 describes various statistics of Volleyball Players in relation to Physiological variables. The average values of Physiological variables of Spikers were: Resting Respiratory rate (breath/ minutes) (14.6 ± 1.8), Resting Heart Rate (beats/minute) (60.2 ± 2.37), Lean body weight (kg.) (68.68 ± 4.127), Body fat (%) (13.6 ± 1.09), Vital Capacity (Liters) (4 ± 0.2) respectively.

In the same age categories, the minimum and maximum values for Physiological variables were: Resting Respiratory rate (11; 17 breath/ minutes) Resting Heart Rate (57; 65 beats/minute) Lean body weight (62; 74.5 kg.) Body fat (11; 15 %) Vital Capacity (3.6; 4.5 Liters).

Conclusion

The variables like Resting Respiratory rate Lean body weight and Body fat were negatively skewed, whereas variables like Resting Heart Rate and Vital Capacity were positively skewed. Negatively skewed distribution shows that most of the data is on the higher side whereas positively skewed distribution shows that the most of the data is on the lower side. On looking at the value of coefficient of variance it was found that the maximum variability was 12.5 in relation to Lean Body Weight whereas minimum variability was noticed in Vital Capacity.

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