

Relationship between Selected Physiological Variables and Performance of Taekwondo Players

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Abstract

The study was conducted to understand the relationship between the selected physiological variables namely aerobic power, anaerobic power, vital capacity and resting pulse rate to the performance of the Taekwondo players. For the purpose of the study 50 Taekwondo players were randomly selected from the population of players came to participate in the Indian Taekwondo League at New Delhi. The selected players underwent Astrand Nomogram (lit./m), Sargent Jump- Lewis Nomogram (Kg. m/sec) and Dry Spirometer Test (lit.) for the aerobic power, anaerobic power and vital capacity respectively while the resting pulse rate was measured manually at the radial artery. The Taekwondo performance of the selected players was evaluated by the panel of three experts on the basis of subjective observation of the player's performance during the competition and was recorded in points to a maximum of 50 points. Mean, Standard Deviation and Pearson product moment correlation (r) were employed for analyzing the data. The study revealed that the mean and standard deviation of aerobic power, anaerobic power, vital capacity and resting pulse rate of the Taekwondo players were 3.56 ± 0.28 lit./min., 125.29 ± 15.45 kg-m./sec., 3895.67 ± 368.72 lit. and 54.78 ± 2.98 beats/ min. respectively and they are significantly correlated with their performance as the coefficient of correlation value's obtained were 0.297, 0.365, 0.518 and -0.431 respectively at $p \leq 0.05$. It was concluded that physiological variables like aerobic power, anaerobic power, vital capacity and resting pulse rate plays an important role in the performance of the Taekwondo players. And hence, it is recommended that the findings of the study must be used to design appropriate training programmes to help athletes acquire suitable strategies so as to improve their aerobic power, anaerobic power, vital capacity and resting pulse rate which will leads to an enhanced level of sports performance.

KEYWORDS: Aerobic Power, Anaerobic Power, Vital Capacity and Resting Pulse Rate

1. Introduction

At present sports competitions are highly competitive and challenging. Human beings by nature are competitive and ambitious for their excellence in all sports performance. Every sportsman or nations wants to show their supremacy by challenging other nations by showing dominance and supremacy in sporting performance in international competitions. Thus this challenge stimulates, inspires and motivates all the nations to sweat and strive to run faster, jump higher, throw faster and exhibit greater strength, endurance and skills in present competitive sports world. This can only be possible through scientific, systematic and planned sports training as well as channeling them into appropriate games and sports by finding out their potentialities. In order to achieve high sport performance at international level all the physical, psychological and physiological abilities and capacities of the sportsman has to be developed to the extreme

limits. Physiological factors such as aerobic power, anaerobic power, vital capacity and VO_2 max plays important role while performing in competitions for achieving a higher level of performance. Therefore this study was taken to understand the relationship between the selected physiological variables namely aerobic power, anaerobic power, vital capacity and resting pulse rate with the performance of the Taekwondo players.

2. Procedure and Methodology

For the purpose of the study 50 Taekwondo players were randomly selected from the population of players came to participate in the Indian Taekwondo League at New Delhi. The selected players underwent Astrand Nomogram (lit./m), Sargent Jump- Lewis Nomogram (Kg. m/sec) and Dry Spirometer Test (lit.) for the aerobic power, anaerobic power and vital capacity respectively while the resting pulse rate was measured manually at the radial artery. The Taekwondo performance of the selected players was evaluated by the panel of three experts on the basis of subjective observation of the player's performance during the series of matches during the competition and was recorded in points to a maximum of 50 points.

3. Statistical Analysis

To assess the aerobic power, anaerobic power, vital capacity and resting pulse rate of the selected subjects, Mean and Standard Deviation were calculated while to find out the relationship between aerobic power, anaerobic power, vital capacity and resting pulse rate with the performance of Taekwondo player's pearson product moment correlation (r) was employed.

4. Analysis of Data and Findings of the Study

Table- 1: Descriptive Statistics of Aerobic Power, Anaerobic Power, Vital Capacity and Resting Pulse Rate

Physiological Variables	N	Mean	Std. Deviation
Aerobic Power	50	3.56	0.28
Anaerobic Power	50	125.29	15.45
Vital Capacity	50	3895.67	368.72
Resting Pulse Rate	50	54.78	2.98

Table- 1 reveals that the mean and standard deviation of aerobic power, anaerobic power, vital capacity and resting pulse rate of the Taekwondo players which were found to be 3.56 ± 0.28 liters/min., 125.29 ± 15.45 Kg-m./sec., 3895.67 ± 368.72 liters and 54.78 ± 2.98 beats/ min. respectively.

Table- 2: Relationship of Aerobic Power, Anaerobic Power, Vital Capacity and Resting Pulse Rate with Performance of the Taekwondo Players

Variable	Pearson Correlation (r)			
	Aerobic Power	Anaerobic Power	Vital Capacity	Resting Pulse Rate
Taekwondo Performance	0.297*	0.365*	0.518*	-0.431*

*Significant at 0.05 level of significance

Table- 2 reveals a significant positive correlation between aerobic power, anaerobic power, vital capacity and a significant negative correlation between resting pulse rate with the performance of the Taekwondo players at the Indian Taekwondo League as the coefficient of correlation (r) were found to be 0.297, 0.365, 0.518 and -0.431 respectively at $p \leq 0.05$.

5. Conclusion

Based on the findings of the present study, it was found that the selected physiological variables had significant correlation with performance of the Taekwondo players. The result of the present study supports the previous researches that the higher aerobic power, anaerobic power, vital capacity and a lower resting heart rate enhances athletes' performance in sport (Amusa Latheef , 1979; Castagna, 2007).

Hence further it is recommended that sport training experts and coaches use the findings of the present study to design appropriate training programmes to help athletes acquire higher aerobic power, anaerobic power, vital capacity and a lower resting heart rate so as to enhance their performance in the sports competitions.

6. References

- Amusa Latheef O., "The Relationship between Soccer Playing Ability and selected Measures of Structure and Physical and Physiological Performance in Coljegenen" **Completed Research in Health, Physical Education and Recreation**, Vol. 21 (1979).
- Castagna et.al. "Relation Between Maximal Aerobic Power and The Ability To Repeat Sprints In Young Basketball Players" **Journal of Strength & Conditioning Research**. Vol.21 (Nov. 2007).
- Gabbett Tim, Kelly Jason, and Troy, "Relationship between Physical Fitness and Playing Ability in Rugby League Players" **Journal of Strength & Conditioning Research**. 21(4):1126-1133, (Nov. 2007).
- Generald D. Tharp, Johnson and Jhorland William G., "Measurement of Anaerobic Power and Capacity in' Elite Young Track Athletes Using Wintage Tests," **Journals of Sports Medicine and Physical Fitness** 24:2 (June 1984).

- Ghai Guru Dutta, "Relationship of selected physique characteristics and Motorability components to performance of Gymnastics" (**Unpublished Master's Thesis, Jiwaji University**), Gwalior, (March, 1984).
- Gutin, Keith and Kerry, "Relationship among sub maximal heart rate Aerobic power and running performance in children. **Research Quarterly**, Vol. 49 (1976).
- Hassain, S.S. "Relationship of selected fitness variables to performance in Basketball", **First National Symposium on Kinanthropometry Souvenir**, (June, 1989).
- Hoffman Jay R. et. al., "The Influence of Aerobic Capacity on Anaerobic Performance and Recovery Indices in Basketball Players," **The Journal of Strength and Conditioning Research**: Vol.13 (1999).
- Kalinski Michael et. al., "Anaerobic Power Characteristics of Elite Athletes in National Level Team Sport games, **European Journal of Sport Science**, Vol.2, No.3 (June,2002).
- Liryd R. Burly, Helen C. Dobell and Belly J. Fossell "Relationship of power, speed, flexibility and certain anthropometric measurement of junior high school girls" **Research quarterly**, 32 (Dec. 1961).
- Mishra Laljee, "Relationship of selected physical and physiological variable to performance in 50 meter front crawl swimming", **Unpublished masters thesis, Jiwaji University**, Gwalior, (1983).
- P.A.Gordon, "Prediction of Basketball playing ability of College Women by Selected tests", **Completed research in Health, Physical Education and Recreation** Vol. 21 (1979).
- Prince N. Gary, The Relationship of College Football Players, Strength, Speed and Agility to the Coaches Ranking of Ability, **Completed Research in Health, Physical Education and Recreation**, (1968).
- Tim Gabbett and Boris Georgieff, "Physiology and Anthropometrics of Australian Junior National, State and Noice Volleyball Players," **Journal of Strength and Conditioning Research**, Vol.21, (Aug.2007).