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Development of a Discriminant Model for Classifying a Triathlon Players into Junior and Senior Category by Selected Physical and Physiological Variables

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ABSTRACT

Purpose of the research work was to analyse physical and physiological variables which can discriminate in between junior and senior category triathlon players aged between 21-25 years from delhi international triathlon meet held in 2017. The four-selected physical and seven physiological variables i.e. thigh girth, calf girth, arm length, leg length, vital capacity, peak flow rate, systolic BP, diastolic BP, pulse rate, negative breath holding, Positive breath holding were selected to construct a Discriminant model. The data were analysed with the help of SPSS version 20. The Discriminant functions revealed two significant functions ($p < 0.05$) i.e. thigh girth and pulse rate which primarily represented differences between junior and senior category. After validation, the analysis demonstrated that 95% of triathletes were accurately grouped in their separate sports. The model shows 66.9% robustness, which explains the variability among the groups.

Keyword: Discriminant Analysis, Physical and Physiological Variables, junior and senior category triathlon players.

1. INTRODUCTION

A triathlon is a multi-recreation staying power and endurance dominating sports which comprising of running, cycling and swimming in prompt progression over various separations. Triathlon is an event such as swimming, biking, and walks in prompt progression over. A triathlon player goes after quickest normal course crowning glory time, along with timed "transitions" among cyclist, swimmer, and runner additives. Because all 3 events are perseverance and continuance type of sports exercises, almost all of triathlon players preferring for cardiovascular working out. Also, seeing that triathlon players need to prepare for three unique

disciplines, they tend to have more adjusted finish body strong improvement than unadulterated cyclists or sprinters, whose tutoring accentuates most straightforward a subset in their musculature.

Triathlon training, includes three modalities concurrently, which can reduce the training duration of the triathlete for every precise game, when compared with an athlete who most effective practices one modality. However, it has been suggested that the aerobic maximal capability use of each modality shows a generalized improvement in the cardiovascular efficiency; this is, evidently precise schooling of a modality intervenes in the different. Therefore, it is believed that the fulfilment in a prolonged triathlon occasion (Ironman) can be assumed by the result of the athlete's capability to hold a sturdy rhythm within the 3 modalities for a prolonged time. The anaerobic threshold has been successfully used as an overall performance parameter in cardio staying power sports being described as the very best metabolic charge in which the blood lactate awareness is kept at an identical degree (steady-kingdom), at some stage in an extended workout the anaerobic threshold can be decided from the ventilator method, and has been proposed as a potential index for prolonged physical games and as a reference for schooling prescription.

2. METHOD

Twenty male subjects were randomly selected from the MP State triathlon championship 2014 for the collection of data from junior and senior level. Subjects provided written, voluntary, informed consent prior to participation. All were regular players and accustomed to good level of exertion. The four-selected physical and seven physiological variables i.e. thigh girth, calf girth, arm length, leg length, vital capacity, peak flow rate, systolic BP, diastolic BP, pulse rate, negative breath holding, Positive breath holding were selected to construct a Discriminant model. Thigh girth, calf girth, arm length, leg length was measured by gullich tape. Vital capacity, peak flow rate was measured by spirometer, systolic and diastolic blood pressure was measured by sphygmomanometer, and pulse rate, negative breath holding, Positive breath holding by stop watch. The data were analysed with the help of statistical procedure in which Descriptive Statistics- Mean and Standard Deviation and stepwise two group discriminant function analysis was applied to know which variables had been generally prescient in junior and senior level, separately, and to decide how precisely and correctly the model predicted group membership.

3. RESULTS

Data collected were analysed statistically with the software package SPSS 20 and the outcome generated has been given below.

Table-1 showed that the mean and standard deviation of triathlon players of junior and senior category in physical variables i.e. thigh girth calf girth, arm length leg length, and in physiological variables i.e. vital capacity, peak flow rate, Systolic blood pressure, Diastolic blood pressure, pulse rate, negative breath holding, positive breath holding, variables.

Table 2 is a classification matrix which indicates the precis of correct and incorrect category of subjects in each the corporations on the premise of advanced discriminant model. From Table 2 it may be seen that out of 10 subjects belonging to junior category eight were efficaciously categorized within the equal category, whereas out of 10 subjects within the senior category 9 have been categorized in the equal class. Thus, out of 20 cases 17 cases were effectively categorized by using the model which is quite high for this reason, the version can be considered as legitimate.

Table 1
Group statistics value of mean and standard deviation of all parameters in different groups

Variables	*Junior*		*Senior*	
	Mean	*S. D*	*Mean*	*S. D*
Thigh Girth	38.4	2.71	42.3	2.98
Calf Girth	28.2	2.04	28.9	3.1
Arm Length	34.7	2.94	37	2.05
Leg Length	74	3.29	77.8	4.68
Vital Capacity	3.65	0.6	3.72	0.51
Peak Flow Rate	620	73.2	607	84.39
Systolic BP	130.6	16.2	118	9.61
Diastolic BP	79	12.7	76.7	5.9
Pulse Rate	83.1	16	88.8	15.31
Negative Breath Holding	26.8	13	22.1	7.62
Positive Breath Holding	30.1	11.9	31.3	7.58

Table 2
Classification of matrix

		Category of Athlete	*Predicted Group Membership*		*Total*
			Junior	*Senior*	
Original	Count	Junior	8	2	10
		Senior	1	9	10
	%	Junior	80	20	100
		Senior	10	90	100

A. 85.0% Of Original Grouped Cases Correctly Classified.

Table 3
Wilks' lambda and chi square of the model

Test of Function(s)	*Wilks Lambda*	*Chi-square*	*df*	*Sig.*
1	0.419	11.164	2	0.004

Table 3 demonstrates the estimation of wilk's lambda appeared in this table is an indication of power in this discriminant model. The estimation of wilk's lambda lies in the middle of 0 and 1. On the off chance that its esteem is under 0.5 the discriminant show is thought to be great. Furthermore, thusly, the discriminant demonstrates created here can be thought to be sufficiently hearty as the estimation of wilk's' lambda is 0.419. Since, the estimation of chi-square appeared in Table 3 is significant as its *p*-esteem is 0.004 which is under 0.05. It might be induced that the discriminant model is highly significant.

Table 4
Unstandardized and standardized canonical discriminant function coefficients

	Standardized	*Unstandardized*
Thigh Girth	1.133	0.397
Pulse Rate	0.767	0.049
(Constant)		–20.238

Table 4 shows that the thigh girth has more discriminating power in the model than pulse rate. The variables selected in the model are thigh girth and pulse rate.

The discriminant score of the model was D = −20.238 + .397 × (thigh girth) − .049 × (pulse rate) with the group Centroids. Therefore, the new mean for the group 1 (Junior) is − .914 and for group 2 (senior) is .914. This shows the midpoint of these two is 0.

4. DISCUSSION

The outcomes uncover that thigh girth is more in senior level triathlon players w compared to the junior level triathlon players. Triathlon is an endurance oriented sport where high levels of oxygen consuming and anaerobic capacities with regards to a most ideal execution, including competition duration of fifty-four to sixty-four minutes for Sprinter in junior class and of one hour forty-five minutes to two hour five minutes for Olympic separations on advance level player (both sexual orientations considered).

A higher peak aerobic output A higher top high-effect yield became gotten for cyclists than for marathon runners. That reality joined with the capacity to hold up any longer at a biomechanically perfect rhythm of ninety rpm demonstrates a more noteworthy productivity for cyclists amid a bicycle journey (Suriano et. al., 2010, 343). Which builds the need of video examination and method/coordination preparing for the cycling component and in addition retaining up the logical evaluation with more thoughtfulness regarding the method for lengthy distance runners. The other variables were not included in the model due to less discriminating power between junior and senior level triathlon players or might be due to low sample size. The overall correct classification (85%) ought to be great and demonstrates the significance physical as well as physiological parameters between junior and senior level triathlon players. Therefore, with this discriminating model an individual can be easily discriminated to both the levels. The discriminant score of the model was D = −20.238 + .397 × (thigh girth) −.049 × (pulse rate) with the group Centroids. In this way, the new mean for the group 1 (Junior) and group 2 (senior) is .914. For information, few endeavours were made to perceive and evaluate the factors that recognize among junior and senior level triathlon players. The effects offered might need to work as a manual for coaches, teacher and additionally for researcher hunting out a reference version for each the age level researched.

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