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Relationship of selected kinematic with physiological and anthropometric parameters of female wrestlers

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Abstract
The objective of the study was to find out the relationship of average speed with selected physiological and anthropometric variables of female wrestlers. For the purpose of the study sixty (N=60) female were randomly chosen from State of Punjab. The age of the subjects ranged between 21 to 30 years. The five different physiological variables such as Resting pulse rate, resting respiratory rate, Maximum breath holding time, resting blood pressure and VO2 max were considered as variables for the present study. The data were collected and interpreted by using standard tools statistical techniques. Mean, Standard Deviation (SD) and correlation coefficient were the statistics used in this study for data interpretation. Level of significant difference between two variables that is kinematic and physiological variables was set at $p<0.05$. For statistical calculations Excel Spread Sheet of windows version 7 was used. Result of the study revealed that there was no significant correlation observed between kinematic variable with the physiological variables of female wrestlers. On the other hand, significant negative correlation was observed between kinematic variables with Body weight, Calf girth, Thigh girth and Hip circumference.

Keywords: Kinematic variables, average speed, resting blood pressure, vo2 max, foot length (cm), calf girth(cm)

Introduction

For achieving success speed ability is the most important components of almost all the sports events including athletics. An improvement in the ability to react quickly, apply significant force rapidly in the appropriate direction, and to redirect that force if needed to achieve ultimate goal that is to improve speed and acceleration. Maximum running speed and acceleration play a vital role in different field of sports including games such as track and field events, rugby, football, hockey etc. However, while maximum velocity is important in field sports performance, it is generally accepted that acceleration ability is of greater significance as players rarely cover large enough distances during sprints efforts to reach to speed (Reilly and Borrie, 1992) [6]. In general, greater the acceleration ability greater will be the average speed means these two kinematic variables are positively correlated. In the present project the researchers were interested to find out the relationship of average speed ability with selected physiological & anthropometric variables, if any. Accordingly, the present project was planned to initiate research work on selected physiological and anthropometric variables to correlate them with the average speed.

Methods and Materials

For the purpose of the study sixty (N=60) female wrestler's students were randomly chosen from Punjab. The age of the subjects ranged between 21 to 30 years. For the purpose of the investigation following variables were taken into consideration Speed, Resting Pulse Rate, Resting Respiratory Rate, Maximum Breath Holding Time, Resting Blood Pressure, VO2 max, Height, Weight, Sitting height, Foot length, Leg length, Thigh girth, Calf girth, Waist and Hip circumferences. Resting pulse rate is measured by little pressure by finger's tips on carotid artery of neck, resting blood pressure measured by stethoscope and sphygmomanometer. Resting respiratory rate is measured by stheoscope to sense the movement of diaphragm. Maximum breathe holding time is measured by stop watch. VO2 max is measured by Queen's college step test. Foot length, standing height, Leg lengths are measured by anthropometric rod. Thigh girth, calf girth, waist and hip circumference are measured by steel tape. Weight is measured by weighting machine. Kinematic variable means speed is calculated by measuring the time taken to cross 50m dash by using proper equations. The data were collected by using standard tools and techniques. Mean, Standard Deviation (SD) and correlation coefficient were the statistics used in this study for data interpretation. Level of significant difference between two variables that is kinematic and physiological variables was set at $p<0.05$. For statistical calculations Excel Spread Sheet of windows version 7 was used.

Results and Discussion

Table 1: Mean and Standard Deviations of Different Physiological Variables and Coefficient of Correlation with Average Speed

Physiological Variables (Unit of measurement)	Mean ± SD	coefficient of correlation 'r'
Average Speed (m/sec)	5.65 ± 0.64	1.000
Resting Pulse Rate (*Minute*)	15.20 ± 1.53	-0.072
Systolic Blood Pressure (*mmHg*)	109.07 ± 7.51	0.085

Diastolic Blood Pressure (*mmHg*)	72.22 ± 6.19	0.231
Resting Respiratory Rate (*Minute*)	19.67 ± 3.66	0.151
Maximum Breath Holding Time (*Sec*)	45.11 ± 12.41	0.077
Pulse rate (*beat/minute*)	143.78 ± 15.96	0.157
VO2 max (*ml.kg-1.min-1*)	39.25 ± 2.95	-0.157

Significant table value of 'r' in p<0.05level at df (58) =0.2542

From table-1 the result may reveal that there was no significant correlation between kinematic variable with selected physiological variables of college female. It was may be due to the fact that the physiological variable such as resting pulse rate, resting blood pressure, resting respiratory rate, maximum breath holding time and VO2max etc will depend upon age, gender and general health of person but in case of short time activity there will be little physiological changes occur than long time physical activity, that's why the researcher found that there was no significant relationship between kinematic variable with selected physiological variables.

Table 2: Mean and Standard Deviations of Different Anthropometric Variables and Coefficient of Correlation with Average Speed

Anthropometric variables (*Unit of measurement*)	**Mean ± SD**	**coefficient of correlation '*r*'**
Average Speed (m/sec)	5.65 ± 0.64	1.000
Body Weight (kg)	52.12 ± 24.72	- 0.48
Standing height(cm)	156.62 ± 5.68	- 0.15
Sitting height (cm)	80.86 ± 2.77	- 0.04
Leg length(cm)	80.87 ± 4.20	- 0.17
Foot length(cm)	22.18 ± 1.59	-0.08
Calf girth(cm)	32.55 ± 5.26	- 0.32
Thigh girth(cm)	53.54 ± 5.49	- 0.37
Hip circumference(cm)	89.57 ± 6.09	- 0.47
Waist Circumference (cm)	70.70 ± 5.88	- 0.15

Significant table value of 'r' in p<0.05level at df (58) =0.2542

On the other hand, from the table-2 the result shows that there were no significant negative relationship between kinematic variable with anthropometric variables except weight, hip circumference and both thigh and calf girth of female Wrestlers. Because we know that very well by the Seldon body type that the slender and tall people are preferable for the vertical jumping ability and long distance running and also known that stride length and stride frequency are diversely related with each other due to their centre of gravity. If stride length is more, stride frequency is less. But short distance athlete requires muscle mass figure not yet to tall and healthy figure. That is the reason that a researcher found significant negative relationship between kinematic variable with weight, hip circumference and both thigh and and calf girth of college female. The result of the study was inconsonance with the finding of Nuhmani, Shibili and Akthar, Nasreen (2014) [7].

Conclusion

- There are no significant relationships between the Kinematic variable with selected Physiological variables.
- There are no significant relationships between the Kinematic variable with height, sitting height, leg length and foot length and waist circumference.
- There are negative significant relationships between the Kinematic variable with weight, hip circumference, calf and thigh girth.

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