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A Study of Anthropometric Variables of Senior Medalist and Non Medalist Fencers.

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Abstract:

The main purpose of the study was to compare the anthropometric variables (arm length, leg length, thigh girth, calf girth and forearm girth) among senior male fencers from the state of Maharashtra. To achieve the objective of the study, a total 259 senior male fencers from the state of Maharashtra were selected as the subjects of the study. Anthropometric variables were measured in nearest a centimeter. To determine the significance difference on anthropometric variables "t" was computed with the help of SPSS software. The level of significance was set at 0.05.

Keywords: Anthropometric variables, State level, Fencing Player, Male.

Introduction:

Anthropometry is the study of the measurement of the human body in terms of the dimensions of bone, muscle, and adipose (fat) tissue. The word "anthropometry" is derived from the Greek word "anthropo" meaning "human" and the Greek word "metron" meaning "measure". The field of anthropometry encompasses a variety of human body measurements. Weight, stature (standing height), recumbent length, skinfold thicknesses, circumferences (head, waist, limb, etc.), limb lengths, and breadths (shoulder, wrist, etc.) are examples of anthropometric measures. Anthropometrical measurement for assessment of physical status was expanded quite naturally to include consideration of body types and the relation of physique to one's health, immunity from disease, posture, physical performance, and personality qualities. Anthropometry provides scientific methods and observation to help in finding out talent in sports. (Anthropometry means the measurement of man). There is profound positive relationship between performance in sports and the anthropometric aspects of an athlete's body. It has been scientifically proved that different sports or different events in a same sport require the demand of different bodily characteristics. The player's anthropometric dimensions, reflecting body shape, proportionality and composition are variables which play a major role in determining the 9 potential for success in chosen sport

The anthropometric capacity of a player is significant for an athlete's successful performance as well as his physiological features and cognitive skills. (Carter, 1970, 1984) states in his studies that athlete's Physique, the proportion of his upper body and lower body, anthropometric characters, is very important for a player achieve success in a sport (Battinelli, 1990). A fencer who possesses a physique of broad shoulder with thin waist, long limbs and great height works to the advantage of an athlete. In fencing the arm length gives the player an advantage of reach. Leg length gives the player to take bigger lunge towards the opponent. The girth of forearm, calf and thigh are good indicators of muscle ratio or amount in the respective area (Alberto.O,et.al. 2010).

Fencing is an ancient traditional vibrant game that has been in the sports society from the first Olympic Games conducted in Athens (1896). The weapons used in fencing are namely: The foil, the sabre and the epee, and each contestant have different rules based on the weapon they are using. The specialty of fencing is even though it is an outdoor game the training and practices are conducted indoors. Fencing is a fast paced game, but the time a match lasts is quite long hours, it may take anywhere between 9 to 11 hours for an international match. The on field time for one fight is between 17 to 48 minutes, 18% is only the time consumed by Bouts in a competition. A fencer is expected to have a good physique, with a high level aerobic and anaerobic lactic metabolism, which depends on their gender, age, experience and the technical knowledge about the game along with rigorous training sessions. The above aspects play a major role for a fencer as to achieve success against their opponent and to become an elite



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player. Fencing includes a lot of movements on field which are not symmetric and to maintain the pace a fencer needs to maintain high concentration skills and use proper forces to control his uneven movements, it could be considered as an unbalanced game, due to these attributes we usually see that a fencers limbs are not in symmetry with his body. Fencing as a game is a combination of physical aspects and cognitive aspects, It involves a lot of planning and strategies to be utilized on field, so it is difficult to tell which is the right technique to achieve success in a game as it completely depends on the fencer, the mind games and mind reading he does on his opponent, he needs to keep changing his strategies based on the opponents attacks and counter- attacks, we can call it a unpredictable game as it not only depends on the fencers physical training but also his cognitive skills and mind games.(Roi and Bianchedi 2008). For this research descriptive survey method was used. A survey research design was used in this study to collect the anthropometric data of senior male fencers from the state of Maharashtra.

For this study convenience sampling method (Prakash V G & Best & Khan) was used to select the sample from the available population. Senior state level fencers from the different district of Maharashtra who were taking part at state level fencing competition organized by Maharashtra state fencing association where considered as the sample of the study. From the total number of available players 259 players were tested from senior category.

The final data collection took place at the state level tournament organized by the Maharashtra state fencing association. The collected data will be further analyzed using statistical tools. Descriptive statistics was used for obtaining mean and standard deviation. The descriptive statistics of the collected score was done. The mean and median were calculated. To get some critical data and some numerical data about what separates medalist from the non-medalist the data of both the groups were compared .To compare between the medalist and non- medalist 't' test was used .

Table 1: The Descriptive Statistics of Anthropometric Variables of Senior Medalist Fencer

Anthropometric Variables	Leg length	Thigh girth	Calf girth	Arm length	Forearm girth
N	28	28	28	28	28
Mean	98.46	47.00	33.50	74.82	25.25
Std. Error of Mean	.832	.675	.503	.580	.407
Median	98.00	47.00	33.00	74.00	25.00
Mode	100	42 ^a	31 ^a	74	24 ^a
Std. Deviation	4.40	3.56	2.66	3.06	2.15
Minimum	92	42	29	70	22
Maximum	111	55	39	83	30

The mean of Leg length is 98.46 (+/-4.40). The minimum leg length of the fencer was found to be 92 and maximum leg length of the fencer was found to be 111.

The mean of Calf length is 33.50 (+/-2.66). The minimum calf girth of the fencer was found to be 29 and maximum calf length of the fencer was found to be 39.

The mean of Arm length is 74.82 (+/-74.82). The minimum Arm length of the fencer was found to be 70 and maximum Arm length of the fencer was found to be 83.

The mean of Forearm length is 25.25 (+/-2.15). The minimum Forearm girth of the fencer was found to be 22 and maximum Forearm length of the fencer was found to be 30.

The mean of Thigh Girth is 47.00 (+/-3.56). The minimum Thigh Girth of the fencer was found to be 42 and maximum Thigh Girth of the fencer was found to be 55.



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Table 2: The Descriptive Statistics of Anthropometric Variables of Senior Non-Medalist Fencer

Anthropometric Variables	Leg length	Thigh Girth	Calf girth	Arm length	Forearm girth
N	231	231	231	231	231
Mean	97.39	45.03	32.58	74.43	24.85
Std. Error of Mean	.259	.332	.238	.235	.171
Median	97.00	45.00	33.00	74.00	25.00
Mode	95	45	33	73	26
Std. Deviation	3.93	5.04	3.61	3.56	2.59
Minimum	90	33	24	68	17
Maximum	112	62	43	87	30

The mean of Leg length is 97.39 (+/-3.93). The minimum leg length of the fencer was found to be 90 and maximum leg length of the fencer was found to be 112.

The mean of Calf length is 32.58 (+/-3.61). The minimum calf girth of the fencer was found to be 24 and maximum calf length of the fencer was found to be 43.

The mean of Arm length is 74.43 (+/-3.56). The minimum Arm length of the fencer was found to be 68 and maximum Arm length of the fencer was found to be 87.

The mean of Forearm length is 24.85 (+/-2.59). The minimum Forearm girth of the fencer was found to be 17 and maximum Forearm length of the fencer was found to be 30.

The mean of Thigh Girth is 45.03 (+/-5.04). The minimum Thigh Girth of the fencer was found to be 33 and maximum Thigh Girth of the fencer was found to be 62.

To test the equality of variances, Levene's test was used. F-value for Leg Length is 0.487 which is insignificant as the p-value is 0.486 which is more than 0.05. Thus it is concluded that the variances of the two groups are equal.

It can be seen that the value of t-statistic is -1.34. This t-value is insignificant as the p-value is 0.18 which is more than 0.05. Thus the null hypothesis of equality of Leg Length is accepted and it may be concluded that the Leg Length of senior medalist with senior non medalist are equal.

To test the equality of variances, Levene's test was used. F-value for Thigh Girth is 2.51 which is insignificant as the p-value is 0.11 which is more than 0.05. Thus it is concluded that the variances of the two groups are equal.

It can be seen that the value of t-statistic is -1.99. This t-value is significant as the p-value is 0.04 which is less than 0.05. Thus the null hypothesis of equality of Thigh Girth is rejected and it may be concluded that the Thigh Girth of senior medalist with senior non medalist are not equal.

To test the equality of variances, Levene's test was used. F-value for Calf girth is 2.55 which is insignificant as the p-value is 0.11 which is more than 0.05. Thus it is concluded that the variances of the two groups are equal.

It can be seen that the value of t-statistic is -1.30. This t-value is insignificant as the p-value is 0.19 which is more than 0.05. Thus the null hypothesis of equality of Calf girth is accepted and it may be concluded that the Calf girth of senior medalist with senior non medalist are equal.

To test the equality of variances, Levene's test was used. F-value for Arm Length is 2.20 which is insignificant as the p-value is 0.13 which is more than 0.05. Thus it is concluded that the variances of the two groups are equal.

It can be seen that the value of t-statistic is -0.55. This t-value is insignificant as the p-value is 0.58 which is more than 0.05. Thus the null hypothesis of equality of Arm Length is accepted and it may be concluded that the Arm Length of senior medalist with senior non medalist are equal.





To test the equality of variances, Levene's test was used. F-value for Forearm girth is 2.01 which is insignificant as the p-value is 0.15 which is more than 0.05. Thus it is concluded that the variances of the two groups are equal.

Table 3: Comparison of Anthropometric Variables by t test between senior medalist with senior non medalist fencers

	F	Sig.	t	df	Sig.
Leg length					
Equal variances assumed	.487	.486	-1.342	257	.181
Equal variances not assumed			-1.229	32.444	.228
Thigh girth					
Equal variances assumed	2.518	.114	-1.999	257	.047
Equal variances not assumed			-2.614	41.389	.012
Calf girth					
Equal variances assumed	2.552	.111	-1.309	257	.192
Equal variances not assumed			-1.662	40.231	.104
Arm Length					
Equal variances assumed	2.200	.139	-.552	257	.581
Equal variances not assumed			-.621	36.453	.538
Forearm girth					
Equal variances assumed	2.016	.157	-.779	257	.437
Equal variances not assumed			-.900	37.176	.374

It can be seen that the value of t-statistic is -0.77. This t-value is insignificant as the p-value is 0.43 which is more than 0.05. Thus the null hypothesis of equality of Forearm girth is accepted and it may be concluded that the Forearm girth of senior medalist with senior non medalist are equal.

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