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A comparative study of selected anthropometric variables of judo and wrestling medalists of Delhi University

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Abstract
The purpose of the study was to compare the anthropometric measurements of Judo and wrestling medalists of Delhi University, a total of 100 male players (i.e. 50 Judokas and 50 Wrestlers) were purposively selected to act as subjects for the proposed study. The age of the subjects ranged between 18 to 25 years and the mean age of the subjects was found to be 21±2.19 years. The subjects were sports persons with medals in Inter Collegiate level competition in their respective sports discipline from different colleges of Delhi University. Calf Skin-Fold measurements of Wrestlers were significantly higher than judo players, statistically no significant difference was observed in the biceps, triceps, thigh, measurement of judo and wrestling players. Arm Length, Palm Length and Shoulder Width of Judokas were significantly higher than the wrestling players, statistically no significant difference was observed in the Leg Length and Wrist Width Measurement between the judo and wrestling players and a significant difference has been found in the arm length and shoulder width of Judokas and Wrestlers.

Keywords: Anthropometry, wrestling, judo

Introduction

Sports performance is a multidimensional product of athlete's capacities and their interaction with athletic environment. Being multidimensional suggests that a variety of factors are involved in actually attaining performance goals (Roy, 1986) [13].

In order to give the best possible performance at any of the competitions the assistance of scientific disciplines is sought. Induction of the basic principles of science, physical education and sports has become a subject of scientific research. Now various special branches of science such as anthropometric, biomechanics, physiology of exercises, psychology of sports, sociology of sports etc. have been established which are connected with better performance in sports. New techniques have been evolved, based on insight and understanding of the sports researchers. Astounding performance in sports activities after revival of the modern Olympics have witnessed the result of this scientific approach adopted by the physical education and sports. Smt. Indira Gandhi had rightly said that science applied to sports has enabled modern youth to develop physical capacities beyond anything earlier imagined. Sports have become competitive and records are being broken at an increasing rate (Helina, 2009) [7].

Anthropometry, a quantitative interface between anatomy and physiology, provides appraisal of an individual's structural status as well as provides quantification for different growth and training influences. There have been reports on investigations on the relationships between Anthropometry and physical performance parameters and sport performance. It was examined that the influence of Anthropometry characteristics and physical performance on the competition results and suggested that Anthropometry characteristics and physical performance are closely correlated to each others. Anthropometry helps the sport scientists to identify the anthropometric characteristics to predict the performance. Requirement of sport-specific physique for superior performance in sports had been reported by different studies. Anthropometry measurements in relation to performance has been reported in different sports *viz.* basketball players, volleyball players from colleges and universities of North India, national level athletes from Bangladesh institute of sports, wrestlers from Colombia, Indian elite male hockey players, track and field athletes, volleyball players, baseball players, softball

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players, water sports athletes, football players, handball players and gymnastic players (Douda, 2008) [14].

The term was first used by Ross *et al.* (1980) in the year 1972. It means the application of measurement to the study of human size, shape, proportion, compositions, maturation and gross function. The purpose is always to understand human movement in the field of growth, exercise performance and nutrition. The word Anthropometry is derived etymologically from Greek Words Anthrepos meaning "man" and matrecin meaning "to measure (Rose, 1980) [15]."

Anthropometry provides a convenient framework for the study of human body. It studies quantitative, interaction between human structure and human function. It is defined by international society for the advancement of Anthropometry (I.S.A.K.) as "a scientific specialization dealing with the measurement of man in variety of morphological perspectives its application to movement and those factors which influence movement including composition, shape and maturation, motor abilities and cardio-respiratory capacities, physical activities including recreational activity as well as highly specialized sports performance".

Anthropometry is the study of human size, shape, proportion and composition maturation and gross function in order to help understand growth exercises, performance and nutrition Anthropometry is a vehicle for individual to contribute to basic research and application in medicine, education and government and also as a science has so far driven maximum potential of development for the science of sports and physical education. For the high performance athletes, as Ross explains, the gross function is represented in kind by the sport event and level by the selection as well as relative success in the competition.

Objectives and Hypothesis
The following objectives were set for the study
▪ To assess the selected Skin fold measurements, and linear measurements of male Judo and Wrestling medalists of Delhi University.
▪ To compare the skin fold measurements of male Judo and Wrestling medalists of Delhi University.
▪ To compare the linear measurements of male Judo and Wrestling medalists of Delhi University.

Based on the objectives following hypothesis were framed
▪ There would be no significant difference in skin fold measurement i.e. biceps, triceps, thigh, calf, between male Judo and Wrestling medalists of Delhi University.
▪ There would be no significant difference in linear measurement i.e. leg length, arm length, wrist girth, shoulder width between male Judo and Wrestling medallists of Delhi University.

Procedure and Methodology
The purpose of the study was to compare the anthropometric measurements of Judo and wrestling medalists of Delhi University, a total of 100 male players (i.e. 50 Judokas and 50 Wrestlers) were purposively selected to act as subjects for the proposed study. The age of the subjects ranged between 18 to 25 years and the mean age of the subjects was found to be 21 ± 2.19 years. The subjects were sports persons with medals in Inter Collegiate level competition in their respective sports discipline from different colleges of Delhi University.

Results and Discussions

Table 1: Descriptive Analysis of the selected anthropometric measurement of Judo Players

Anthropometric Measurements	N	Mean	Standard Deviation
Biceps Skin-Fold	50	2.92	0.44
Triceps Skin-Fold	50	2.81	0.37
Calf Skin-Fold	50	32.11	1.78
Thigh Skin-Fold	50	6.39	0.95
Leg Length	50	36.05	1.64
Arm Length	50	36.89	1.64
Wrist Girth	50	5.79	0.83
Shoulder Width	50	37.38	1.71

Table no. 1 clearly depicts the anthropometric measurement of judo players, which shows that the mean and standard deviation of biceps skin fold, triceps skin fold, calf skin fold, thigh skin fold, leg length, arm length, wrist length and shoulder width are found to be 2.92 ± 0.44, 2.81 ± 0.37, 32.11 ± 1.78, 6.39 ± 0.95, 36.05 ± 1.64, 36.89 ± 1.64, 5.79 ± 0.83 and 37.38 ± 1.71 respectively.

Table 2: Descriptive Analysis of the selected anthropometric measurement of wrestling Players

Anthropometric Measurements	N	Mean	Standard Deviation
Biceps Skin-Fold	50	3.02	0.50
Triceps Skin-Fold	50	2.75	0.31
Calf Skin-Fold	50	33.99	2.39
Thigh Skin-Fold	50	6.65	0.89
Leg Length	50	36.10	1.75
Arm Length	50	27.10	1.72
Wrist Girth	50	5.27	0.93
Shoulder Width	50	36.17	1.88

Table no. 2 clearly depicts the anthropometric measurement of wrestling players, which shows that the mean and standard deviation of biceps skin fold, triceps skin fold, calf skin fold, thigh skin fold, leg length, arm length, wrist length and shoulder width are found to be 3.02 ± 0.50, 2.75 ± 0.31, 33.99 ± 2.39, 6.65 ± 0.89, 36.10 ± 1.75, 27.10 ± 1.72, 5.27 ± 0.93 and 36.17 ± 1.88 respectively.

Table 3: Independent Sample 't' test of anthropometric Measurements between the Judo and Wrestling players

	Variables	F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference
Biceps	Equal variances assumed	0.960	0.329	-0.943	98	0.348	-0.08	0.09
	Equal variances not assumed			-0.943	96.839	0.348	-0.08	0.09
Triceps	Equal variances assumed	1.133	0.290	0.547	98	0.586	0.03	0.06
	Equal variances not assumed			0.547	94.549	0.586	0.03	0.0
Calf	Equal variances assumed	4.091	0.046	-2.619*	98	0.010	-1.10	0.42
	Equal variances not assumed			-2.619*	90.631	0.010	-1.10	0.42
Thigh	Equal variances assumed	0.258	0.612	-1.330	98	0.187	-0.24	0.18
	Equal variances not assumed			-1.330	97.694	0.187	-0.24	0.18
Leg Length	Equal variances assumed	0.545	0.462	1.529	98	0.129	0.52	0.34
	Equal variances not assumed			1.529	97.645	0.129	0.52	0.34
Arm Length	Equal variances assumed	1.738	0.190	2.483*	98	0.015	0.76	0.30
	Equal variances not assumed			2.483*	92.194	0.015	0.76	0.30
Wrist Girth	Equal variances assumed	0.693	0.407	1.267	98	0.208	0.22	0.17
	Equal variances not assumed			1.267	96.826	0.208	0.22	0.17
Shoulder width	Equal variances assumed	1.513	0.222	2.305*	98	0.023	0.8300	0.36
	Equal variances not assumed			2.305*	97.083	0.023	0.8300	0.36

Table No. 3 Clearly depicts the values for Independent sample 't' test between Judo and Wrestling players for the selected anthropometric Measurements, which shows that a significant difference has been found in the Arm Length, and Shoulder Width as the value is found to be 2.483, and 2.305 respectively which is significant at 0.05 level, whereas no significant difference has been found in the biceps skin fold, triceps skin fold, calf skin fold, thigh skin fold, Leg Length, Wrist Width Measurement as the values are not significant at 0.05 level.

Conclusions
Following conclusions were drawn from the obtained results
- Calf Skin-Fold measurements of Wrestlers were significantly higher than judo players.
- Statistically no significant difference was observed in the biceps, triceps, thigh, measurement of judo and wrestling players.
- Arm Length, Palm Length and Shoulder Width of Judokas were significantly higher than the wrestling players.
- Statistically no significant difference was observed in the Leg Length and Wrist Width Measurement between the judo and wrestling players.
- A significant difference has been found in the arm length and shoulder width of Judokas and Wrestlers.

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