International Journal of Physical Education, Sports and Health 2020; 7(4): 211-213

P-ISSN: 2394-1685
E-ISSN: 2394-1693
Impact Factor (ISRA): 5.38
IJPESH 2020; 7(4): 211-213

www.kheljournal.com
Received: 08-05-2020
Accepted: 10-06-2020

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An analysis of selected kinanthropometric variables between badminton and tennis players: A detailed comparative approach

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Abstract
The study basically focussed on the comparison of various important kinanthropometric variables that play a major role in the performance of badminton and tennis all India inter-varsity players. A total of 20 players were taken for the purpose of study from L.N.I.P.E Gwalior, who represented in all India inter-varsity tournaments in badminton and tennis respectively. There were a total of 10 subjects each for both the games, the variables like age, weight, height, skinfold and girth measurements were taken for the purpose of the study, the body fat percentage and body density were also measured to get an overview of their body composition. To compute the data independent sample t-test was used at 0.05 level of significance, there was a significance difference found between the weight (.023*) and the girth measurement of neck (.005*) when compared at 0.05 level of significance, other variables showed insignificant relationship with each other. The mean of body fat percentage of badminton and tennis player was 17.80 and 19.13 respectively whereas the body density was 1.058 and 1.055 respectively.

Keywords: Kinanthropometric, skinfold, fat percentage, body density

Introduction
Since the beginning of the 21st century, multiple theories about science and other disciplines were found. The contemporary scientific world saw an array of discoveries and inventions. The theories are being challenged every day paving way to the new theories either challenging the earlier ones or supporting them and making them more advanced.
Research is the systematic process of discovering new facts and verifying old facts, their sequences, inter-relationship, casual explanations and the natural laws which govern them (Young, 1966)
Sharma (1990) states that the main two objectives of the research are to make amendments in the existing knowledge and to search for new things in the related field. Thus, research takes us ahead of current limits of knowledge.
The use of word "Kinanthropometry" has been gaining more popularity in the recent years. Kinanthropometry is a science which deals with measurements of body and those body parts which are related to kinetics and kinematics. The word kinanthropometry is an acronym of three Greek words "Kineein" means to move, "Anthropos" means man and "Metreein" means to measure.
International Society for the advancement of Kinanthropometry (IASK) defined kinanthropometry as, " Scientific specialization dealing with the measurement of humans in a variety of morphological perspective, its application to movement and those factors which influence movement including components of body build, body measurements, proportions, composition, shape, maturation, motor abilities and cardio-respiratory capacities, physical activity, including recreational activity as well as highly specialized sports performance."
Kinanthropometry plays a vital role in understanding the human body build and measurement so, it is very much important. So, in this study different kinanthropometric variables were taken which plays a major role in the enhancement of sports performance of badminton and tennis all India inter-varsity players.

Purpose
The main objective of the study was to see and compare the various important kinanthropometric

variables that play a major role in the performance of badminton and tennis all India inter-varsity players.

Methods

A total of 20 players were taken for the purpose of study from L.N.I.P.E Gwalior, who represented in all India inter-varsity tournaments in badminton and tennis respectively. There were a total of 10 subjects each for both the games, the variables like age, weight, height, skinfold and girth measurements were taken for the purpose of the study, the body fat percentage and body density were also measured to get an overview of their body composition.

The kinanthropometric variables that were chosen to compare between the players of badminton and tennis are as follows:

a) Age
b) Weight
c) Height
d) Triceps
e) Biceps
f) Sub scapula
g) Supra iliac
h) Head
i) Neck
j) Arm relaxed
k) Arm flexed
l) Forearm
m) Wrist
n) Body density
o) Body fat percentage

Analysis of data, conclusion and discussion

Analysis of data

For the analysis of the data independent sample t-test was used at 0.05 level of significance.

The descriptive table

Table 1: Group Statistics

Variables	subjects	N	Mean	Std. Deviation	Std. Error Mean
age	tennis players	10	22.3000	1.33749	.42295
	badmintion players	10	21.8000	1.31656	.41633
weight	tennis players	10	69.1000	3.66515	1.15902
	badmintion players	10	64.6000	4.42719	1.40000
height	tennis players	10	171.8000	3.19026	1.00885
	badmintion players	10	171.9000	5.23768	1.65630
triceps	tennis players	10	10.2000	6.28579	1.98774
	badmintion players	10	10.9000	5.23768	1.65630
biceps	tennis players	10	8.3000	5.18652	1.64012
	badmintion players	10	8.0000	5.12076	1.61933
sub_scapula	tennis players	10	15.2000	4.41714	1.39682
	badmintion players	10	13.3000	3.09300	.97809
supra_illiac	tennis players	10	19.4000	6.32807	2.00111
	badmintion players	10	15.1000	2.96086	.93630
head	tennis players	10	50.5300	.15670	.04955
	badmintion players	10	50.4100	.14491	.04583
neck	tennis players	10	30.5200	.11353	.03590
	badmintion players	10	30.3000	.18257	.05774
arm_relaxed	tennis players	10	22.3000	3.56713	1.12803
	badmintion players	10	20.4600	.13499	.04269
arm_flexed	tennis players	10	29.5000	2.49978	.79050
	badmintion players	10	30.3300	.23594	.07461
forearm	tennis players	10	20.6200	.13984	.04422
	badmintion players	10	20.4700	.18886	.05972
wrist	tennis players	10	10.5500	.11785	.03727
	badmintion players	10	10.4500	.12693	.04014
body_density	tennis players	10	1.0552	.00832	.00263
	badmintion players	10	1.0582	.00736	.00233
body_fat_percentage	tennis players	10	19.1382	3.69370	1.16805
	badmintion players	10	17.8073	3.26535	1.03260

Table 2: Independent Samples Test

		Levene's Test for Equality of Variances		t-test for Equality of Means				
		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference
age	Equal variances assumed	.003	.954	.842	18	.411	.50000	.59348
	Equal variances not assumed			.842	17.996	.411	.50000	.59348
weight	Equal variances assumed	.625	.439	2.476	18	.023	4.50000	1.81751
	Equal variances not assumed			2.476	17.394	.024	4.50000	1.81751
height	Equal variances assumed	1.006	.329	-.052	18	.959	-.10000	1.93936
	Equal variances not assumed			-.052	14.870	.960	-.10000	1.93936
triceps	Equal variances assumed	.596	.450	-.271	18	.790	-.70000	2.58736
	Equal variances not assumed			-.271	17.433	.790	-.70000	2.58736
biceps	Equal variances assumed	.025	.875	.130	18	.898	.30000	2.30483
	Equal variances not assumed			.130	17.997	.898	.30000	2.30483

sub_scapula	Equal variances assumed	2.006	.174	1.114	18	.280	1.90000	1.70522
	Equal variances not assumed			1.114	16.115	.282	1.90000	1.70522
supra_illiac	Equal variances assumed	9.095	.007	1.946	18	.067	4.30000	2.20932
	Equal variances not assumed			1.946	12.760	.074	4.30000	2.20932
head	Equal variances assumed	.071	.793	1.778	18	.092	.12000	.06749
	Equal variances not assumed			1.778	17.891	.092	.12000	.06749
neck	Equal variances assumed	1.200	.288	3.236	18	.005	.22000	.06799
	Equal variances not assumed			3.236	15.055	.006	.22000	.06799
arm_relaxed	Equal variances assumed	13.929	.002	1.630	18	.120	1.84000	1.12883
	Equal variances not assumed			1.630	9.026	.137	1.84000	1.12883
arm_flexed	Equal variances assumed	3.680	.071	-1.045	18	.310	-.83000	.79401
	Equal variances not assumed			-1.045	9.160	.323	-.83000	.79401
forearm	Equal variances assumed	1.022	.325	2.019	18	.059	.15000	.07431
	Equal variances not assumed			2.019	16.588	.060	.15000	.07431
wrist	Equal variances assumed	.000	1.000	1.826	18	.085	.10000	.05477
	Equal variances not assumed			1.826	17.902	.085	.10000	.05477
body_density	Equal variances assumed	.604	.447	-.851	18	.406	-.00299	.00351
	Equal variances not assumed			-.851	17.739	.406	-.00299	.00351
body_fat_percentage	Equal variances assumed	.625	.439	.854	18	.405	1.33088	1.55904
	Equal variances not assumed			.854	17.733	.405	1.33088	1.55904

Results

To compute the results independent sample t-test was used at 0.05 level of significance. The result showed a significant difference between the weight (.023*) and the girth measurement of neck (.005*) when compared at 0.05 level of significance, other variables showed insignificant relationship with each other. The mean of body fat percentage of badminton and tennis player was 17.80 and 19.13 respectively where as the body density was 1.058 and 1.055 respectively.

Conclusions

With the above result the following conclusions can be drawn:

1. Weight and neck girth showed a significant relation when compared.
2. Badminton players are more ripped than tennis players.
3. The body densities of both the groups are almost same, but the shuttlers got a marginal edge over the tennis players.

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