RESEARCH PAPER

Comparative study of skinfold measurements of players in different games

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ABSTRACT

The purpose of the study was to find out comparative study of skinfold measurements of players in different games. The study was delimited to 55 individual performing different game events namely athletics (14 nos.), taekwondo (14 nos.), swimming (14 nos.) and cycling (13 nos.) aged between 18 and 22 years, who were undergoing training at SAI-LNCPE,TVM. The variables selected for the study were skinfold measurements (Supraspinale skinsfold, Abdominal skinsfold, Front thigh skins fold and Medical calf skins fold). Descriptive statistics were calculated for different skinfold measurements. Analysis of variance techniques was performed followed by multiple comparison method was used to study the between group variation. Results of the study reveal that supraspinale skinfold is maximum for taekwondo players followed by swimmers, abdominal skinfold is high in the case of taekwondo players whereas front thigh skinfold measurement is high for cycling group, the cycling group uses front thigh at higher level in comparison with athletes, might have helped them to increase the measurement of front thigh skinfold, taekwondo players uses their body at maximum level in comparison with athletic group, which may enhance the development in medial calf skinfold measurement.

Key Words : Skin fold measurements, Supraspinale skins fold, Abdominal skins fold, Front thigh skins fold, Medical calf skins fold.

Skinfolds measurement provides an estimate of body fat and some skinfold ratios have been proposed for use in evaluating fat distribution. Some skinfolds (subscapular and tricipital) have been described as markers of the central distribution of fat mass and others have been correlated with subcutaneous abdominal fat. However, measurements of skinfold thickness are inaccurate in obese subjects becausein general skinfold thickness exceeds the width of the caliper. Although an equation using skinfold measurement to predict the different compartments of abdominal fat has been validated in populations with a BMI < 30 kg/m correlations between skinfold measures and intra-abdominal fat area become weaker with increasing age and no there are no data available to validate these measures for the evaluation of abdominal fat in severely obese persons. Skinfold thickness describes the amount of subcutaneous fat when the fold is lifted and its thickness measured by specialized calipers. The sum of skinfolds (generally from eight sites in the standard ISAK protocol) provides data for comparison with population norms, or for monitoring changes over time within the same individual. Devices

to measure the thickness of a compressed, double layer of skin plus the underlying SAT have been used ubiquitously for well over 50 years. Unfortunately, much of the published data cannot be relied upon due to vast differences in caliper specifications, the number and location of skinfold sites and a lack of standardization in operator technique and data treatment. There are over 100 body fat prediction equations derived from skinfold measurements and their inconsistent results stem from differences in the populations that were sampled.

RESEARCH METHODOLOGY

Skinfold measurements (Supraspinale skins fold, Abdominal skins fold, Front thigh skins fold and medical calf skinsfold) data were collected from 55 individual performing different game events namely athletics (14 nos.), taekwondo (14 nos.), swimming (14 nos.) and cycling (13 nos.) for the purpose of study, from LNCPE, Trivandrum. Descriptive statistics were calculated for different skinfold measurements. Analysis of variance techniques was performed followed by multiple comparison method was used to study the between group variation.

RESULTS AND REMONSTRATION

Table 1 presented show the descriptive statistics of skinfold measurements. The table indicates that mean supraspinale skinfold is maximum for taekwondo players followed by swimmers.

The measurement is least for the athletic group. It also depicts that the standard deviation is high for the taekwondo players indicating that there is high variability in supraspinale skinfold measurements among taekwondo players.

Abdominal skinfold is high in the case of taekwondo players whereas front thigh skinfold measurement is high for cycling group. The table also infers that athletes are having least measurements for all the four skinfold measurements.

Table 2 presented the result of analysis of variance. It can see from the table that supraspinale skinfold, front thigh skinfold and medial calf skinfold are significant at 1 per cent level of significance, whereas abdominal skinfold is significant at 5 per cent level of significance. This indicates that these measurements are significantly different in different groups.

Table 3 explains the result of multiple comparisons

Table 1: Descriptive statistics of skinfold measurements						
Sr. No.	Variables	Group	Mean	Sd	Min	Max
1.	Supraspinale skinfold	Cycling	6.80	1.88	4.80	9.40
		Swimming	7.05	1.13	5.40	8.60
		Taekwondo	8.82	3.25	4.80	14.00
		Athletics	5.80	1.13	4.00	8.00
		Total	6.65	2.07	4.00	14.00
2.	Abdominal skinfold	Cycling	10.54	3.84	6.80	17.40
		Swimming	9.57	2.59	7.40	15.20
		Taekwondo	11.61	4.31	6.40	18.00
		Athletics	8.24	2.63	4.80	15.20
		Total	9.34	3.34	4.80	18.00
3.	Front thigh skinfold	Cycling	11.85	2.55	9.20	16.20
		Swimming	11.12	2.79	7.40	15.20
		Taekwondo	11.60	3.40	7.40	16.60
		Athletics	7.41	2.06	4.40	12.40
		Total	9.27	3.20	4.40	16.60
4.	Medial calf skinfold	Cycling	7.14	1.31	5.00	9.00
		Swimming	8.10	2.55	5.40	14.10
		Taekwondo	7.58	1.79	5.80	12.00
		Athletics	5.19	1.36	3.20	8.40
		Total	6.29	2.03	3.20	14.10

among different groups with respect to supraspinale skinfold. It can see that taekwondo and athletics are significantly different whereas all other groups are on par with respect to the supraspinale skinfold measurement. It is an indication that, abdominal movement may be high in taekwondo players might have helped to improve the supraspinale skinfold measurement among them.

Table 4 explains the result of multiple comparison among different groups with respect to abdominal skinfold. It can confirm that, cycling and swimming are on par with all others, whereas taekwondo and athletics

shows significant difference on abdominal skinfold measurement.

Table 5 describes the result of multiple comparison for front thigh skinfold measurements. It is clear from the table that cycling is on par with swimming and taekwondo players, whereas it is significantly different from the athletics group as the cycling group uses front thigh at higher level in comparison with athletes, might have helped them to increase the measurement of front thigh skinfold. it also obvious that taekwondo players shows significant difference with athletes on front thigh skinfold measurements as the taekwondo players uses

Table 2: Analysis of variance of mean scores on triceps skinfold among sports groups

Variables	Variance	Sum of squares	DF	Mean squares	F	Sig (P)
Supraspinale	Between groups	70.19	3	23.30	7.34*	.000
skinfold	Within groups	162.41	51	3.19		
	Total	232.61	54			
Abdominal	Between groups	98.39	3	32.80	3.31*	.027
skinfold	Within groups	504.53	51	9.80		
	Total	602.93	54			
Front thigh	Between groups	232.45	3	77.48	12.29*	.000
skinfold	Within groups	321.73	51	6.30		
	Total	554.19	54			
Medial calf	Between groups	84.23	3	28.08	10.29*	.000
skinfold	Within groups	139.20	51	2.72		
	Total	223.43	54			

*indicate significance of value at P=0.05

Table 3 : Significance of difference between paired means on supraspinale skinfold of different sports groups

Paired means		Mean difference	Significance
Cycling (M=6.80)	Swimming (M=7.05)	0.25	0.99
	Taekwondo (M=8.82)	2.02	0.17
	Athletics (M=5.80)	1.0	0.62
Swimming (M=7.05)	Taekwondo (M=8.82)	1.77	0.24
	Athletics (M=5.80)	1.25	0.38
Taekwondo (M=8.82)	Athletics (M=5.80)	3.02*	0.00

*indicate significance of value at P=0.05

Table 4 : Significance of difference between paired means on abdominal skinfold of different sports groups

Paired means		Mean difference	Significance
Cycling (M=10.54)	Swimming (M=9.57)	0.96	0.95
	Taekwondo (M=11.61)	1.06	0.92
	Athletics (M=8.24)	2.3	0.39
Swimming (M=9.57)	Taekwondo (M=11.61)	2.03	0.60
	Athletics (M=8.24)	1.33	0.77
Taekwondo (M=11.61)	Athletics (M=8.24)	3.37*	0.04

*indicate significance of value at P=0.05

Table 5 : Significance of difference between paired means on front thigh skinfold of different sports groups

Paired means		Mean difference	Significance
Cycling (M=11.85)	Swimming (M=11.12)	0.73	0.95
	Taekwondo (M=11.60)	0.25	0.99
	Athletics (M=7.41)	4.44*	0.001
Swimming (M=11.12)	Taekwondo (M=11.60)	0.47	0.98
	Athletics (M=7.41)	3.71	0.006
Taekwondo (M=11.60)	Athletics (M=7.41)	4.19*	0.001

*indicate significance of value at P=0.05

Table 6 : Significance of difference between paired means on medial calf skinfold of different sports groups

Paired means		Mean difference	Significance
Cycling (M=7.14)	Swimming (M=8.10)	0.95	0.74
	Taekwondo (M=7.58)	0.43	0.96
	Athletics (M=5.19)	1.95	0.06
Swimming (M=8.10)	Taekwondo (M=7.58)	0.52	0.93
	Athletics (M=5.19)	2.91*	0.001
Taekwondo (M=7.58)	Athletics (M=5.19)	2.39*	0.003

*indicate significance of value at P=0.05

their legs at maximum level for the game, might have made an increase in the measurement of front thigh skinfold.

Table 6 describes the result of multiple comparison for medial calf skinfold measurements. It is very clear from the table that cycling group is on par with all others and no significant difference among the groups. Swimmers show significant difference with Athletes at one per cent level of significance. It is also inferred from the table that taekwondo players shows significant difference with athletes on medial calf skinfold measurements. This may be due to the fact that taekwondo players use their body at maximum level in comparison with athletic group, which may enhance the development in medial calf skinfold measurement. Similar work related to the present investigation was also carried out by Gualdi Russo *et al*.(1992); Lohman (1988); Nath (1993) and Sodhi (1991).

Conclusion:

The supraspinale skinfold is maximum for taekwondo players followed by swimmers. Abdominal skinfold is high in the case of taekwondo players whereas front thigh skinfold measurement is high for cycling group,

the cycling group uses front thigh at higher level in comparison with athletes, might have helped them to increase the measurement of front thigh skinfold, Taekwondo players uses their body at maximum level in comparison with athletic group, which may enhance the development in medial calf skinfold measurement. The taekwondo players uses their legs at maximum level for the game, might have made an increase in the measurement of front thigh skinfold.

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