International Journal of Multidisciplinary Approach and Studies

ISSN NO:: 2348 – 537X

Effect of Weight Training on Selected Anthropometric Variables Among Rajbangsi Boys

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ABSTRACT:

The purpose of the study was to find out the effect of weight training on selected anthropometric variables such as head circumference(HC), chest circumference(CC), upper arm girth(UAG), thigh girth(TG), calf girth(CG) and sitting height(SH) among Rajbangsi boys. To achieve this purpose of the study, hundred (100) school going boys (14-16 years) were selected randomly two subdivisions in the district of Uttardinajpur, West Bengal. They were divided into two groups such as Rajbangsi Group (GR) and General Group (GG). Both group were divided into two groups such as experimental and control group, each consisting of twenty five (25) subjects. Selected weight training programme for 16 weeks was assigned as treatment to the entire experimental group. The selected criterion variables were assessed using standard procedures, before and after the training regimen. Data were analyzed with pair t-test and student t-test using SPSS version 19. The level of significance was set as 0.05. Data revealed that the improvement of head circumference, upper arm girth, thigh girth, calf girth and sitting height were better among Rajbangsi boys in comparison to General boys. These results suggest that weight training has significant influence in improving selected anthropometric variables.

Keywords: *Rajbangsi, Anthropometry, Weight Training*

INTRODUCTION:

The main essence of the study was embodied on the effect of weight training among an ethnic community of North Bengal called 'Rajbangsi' with distinctive physical features along with their observable physiognomy. Anthropometrically the Rajbangsi community is quite different from that of the General population in the same locality due to specific physiognomy of a mixed breed of Koches predominantly Mongoloid. Rajbangsi community people have darker skin and some are black, the nose is flat at least the tip of the nose is broad, high chick bones and thick lips, the eyes generally small and slightly oblique (Sanyal, 2002). Rajbangsi is the largest scheduled caste community in the state of West Bengal. According to the latest 2011 census estimate their population is about 3801677 in the state of whom majority (about 80%) are found to live in the northern parts of the state community known as "North Bengal". Rajbangsi occupy an important place in the southern districts of North Bengal which include Malda and two (North and South) Dinajpur districts. Geographically, they have greater concentration in region between river Kulick and river Tangan, an area stretching over the South and parts of North Dinapur districts. (Mukhopadhyay, 2013).

The knowledge of anthropometric characteristics is essential for the physical education planning, choice of methods and organisational types of work and in the choice of exercises. The choice of these characteristics was influenced by thinking and belief that experimental treatment would provoke the largest growth in this field.

Reddy(2000), Mitra(2002) and Tiwari (2007) were found that all anthropometric measurements such as body weight, height, sitting height, head circumference, upper arm circumference, calf circumference and chest circumference exhibit uniform increase with age.

MacDonald,CJ, Lamont, HS, and Garner, JC,(2012) were suggested that traditional resistance training, plyometric training and complex training have an effect on quadriceps girth, triceps girth and body mass. The present study analyzed the effect of weight training on selected anthropometric variables among Rajbangsi boys.

MATERIALS AND METHODOLOGY

Subjects:

Total hundred (100) boys, fifty (50) Rajbangsi community and fifty (50) general community, were selected randomly as subjects from two subdivisions in the district of Uttar Dinajpur, West Bengal. Personal data of the subjects were given in table-1.

Criterion measures:

Various anthropometric measures of subjects were considered as the criterion measures such as body weight, height, head circumference, chest circumference, upper arm girth, thigh girth, calf girth and sitting height.

Experimental design:

The experiment conducted on 14-16 years school going boys. Total 100 subjects (GR=50 and GG=50) were selected randomly from two subdivisions in the district of Uttar Dinajpur, West Bengal. Both group were divided into two groups such as experimental and control group, each consisting of 25 subjects. The selected weight training programme(specially for children and adolescent) including bench press, biceps curl, push ups, standing heel raise, squat, triceps extention, abdominal crunches, wrist curl, step ups exercises was assigned as treatment to all the experimental groups. The duration of the experimental period was 16 weeks excluding the days required for initial and final test. The treatment was given thrice (Monday, Wednesday, and Friday) in a week in the afternoon session for a duration of approximately 60 minutes which include warm-up for 5-10 minutes and cooling down for 5-6 minutes. The volume and repetitions of the exercises were fixed according to the principles of weight training and goal of the study.

Statistical analysis:

The mean and standard deviation (S.D) were calculated for the analysis of the data as descriptive statistics. Statistical significance of two groups, mean difference was tested by Pair t-test and Student t-test. All the statistics were calculated by using SPSS version 19. The level of significance was set as 0.05.

RESULTS AND DISCUSSION

Results:

Table-1.Personal Data of Group RExpt and GExpt.

	RExpt.(Mean SD)	GExpt.(Mean SD)	t-value
Age(Years)	15.02±0.50	14.96±0.56	0.43
Height(Meters)	1.588±0.082	1.596±0.064	0.42
Weight(Kg.)	46.8±6.37	45.92±7.62	0.44
BMI	18.64±2.00	17.84±1.82	1.48

Significant at 0.05 level of confidence. RExpt.- Raibangsi experimental, GExpt.- General experimental

Table-1 represents age, height, weight and BMI as personal data of the subject. After comparing the means of the above mentioned data and corresponding t-values show no significant difference at 0.05 level of confidence which may be considered both the experimental group as equated group.

Table-2.Comparison of means of selected anthropometric variables of GExpt Group after 16 weeks experimental period.

Parameters		Mean ± SD	SED	df	t	Sig (2-tailed)
HC(cm)	Pre Post	52.96 ± 1.54 53.08 ± 1.53	.07	24	1.81	.083
CC (cm)	Pre Post	75.52 ± 5.16 75.84 ± 5.68	.40	24	.802	.430
UAG(cm)	Pre Post	20.76 ± 1.76 21.96 ± 1.90	.15	24	7.86*	.000
TG (cm)	Pre Post	40.76 ± 3.50 40.80 ± 3.14	.38	24	0.106	.916
CG (cm)	Pre Post	29.20±2.58 30.08 ± 2.34	.19	24	4.74*	.000
SH (cm)	Pre Post	82.88 ± 4.29 83.52 ± 3.70	.18	24	3.53*	.002

***Significant at 0.05 level of confidence.**

Table: 2 represent the comparison of means of selected anthropometric variables of GExpt group after 16 weeks experimental period. The t-value of HC, CC, UAG, TG, CG and SH were 1.81, .802, 7.86, 0.106, 4.74 and 3.53 respectively. The t-value of UAG, CG and SH were significant at 0.05 level of confidence. To be significant at 0.05 level of confidence the t-value should be greater than 2.06.

Table-3.Comparison of means of selected anthropometric variables of RExpt. Group after 16 weeks experimental period.

Parameters		Mean ± SD	SED	df	t	Sig (2-tailed)
HC (cm)	Pre Post	53.92 ± 1.19 54.28 ± 1.07	.09	24	3.84*	.083
CC (cm)	Pre Post	77.40 ± 6.09 77.68 ± 5.42	.91	24	.781	.430
UAG (cm)	Pre Post	21.52 ± 2.28 22.76 ± 2.09	.16	24	7.96*	.000
TG (cm)	Pre Post	41.40 ± 3.27 43.48 ± 2.96	.45	24	5.54*	.053
CG (cm)	Pre Post	30.60 ± 2.29 31.76, ± 2.28	.34	24	3.41*	.002
SH(cm)	Pre Post	86.56 ± 3.34 86.84 ± 3.35	.40	24	4.21*	.000

Significant at 0.05 level of confidence.

Table-3 represents the comparison of means of selected anthropometric variables of Rajbangsi Expt. group after 16 weeks experimental period. The t-value of HC, CC, UAG, TG, CG and SH were 3.84, .781, 7.96, 5.54, 3.41, and 4.21 respectively. The t-values of HC, UAG, TG, CG and SH were significant at 0.05 level of confidence. To be significant at 0.05 level of confidence the t value should be greater than 2.06.

TABLE: 4.Comparison of means of selected anthropometric variables of GCont. Group after the study.

Parameters		Mean ± SD	SED	df	t	Sig (2-tailed)
HC (cm)	Pre Post	52.16 ± 1.57 52.28 ± 1.59	.066	24	1.81	.083
CC (cm)	Pre Post	75.44 ± 4.57 75.48 ±4.83	1.331	24	0.030	.976
UAG(cm)	Pre Post	20.00 ± 2.24 20.88 ± 2.09	.1451	24	6.063*	.000
TG (cm)	Pre Post	38.92 ± 3.38 39.00 ± 3.45	.055	24	1.444	.161
CG (cm)	Pre Post	28.12 ± 2.45 28.24 ± 2.35	.066	24	1.809	.083
SH (cm)	Pre Post	80.12 ± 6.67 80.72 ± 6.43	.1528	24	3.928*	.001

Significant at 0.05 level of confidence. GCont.- General control

Table-4 represents the comparison of means of selected anthropometric variables of GCont. Group after the study. The t-value of HC, CC, UAG, TG, CG and SH were 1.81, 0.030, 6.063, 1.444, 1.809 and 3.928 respectively. The t-values of UAG and SH were significant at 0.05 level of confidence. To be significant at 0.05 level of confidence t value should be greater than 2.06.

TABLE: 5.Comparison of means of selected anthropometric variables of RCont. Group after the study.

Parameters		Mean ± SD	SED	df	t	Sig (2-tailed)
HC (cm)	Pre Post	53.00 ± 1.91 53.58 ± 1.61	.12	24	4.437*	.000
CC (cm)	Pre Post	77.64 ± 4.95 77.88 ± 5.23	.19	24	1.296	.207
UAG (cm)	Pre Post	20.64 ± 2.55 21.64 ± 2.34	.16	24	6.124*	.000
TG (cm)	Pre Post	39.92 ± 4.18 41.68 ± 4.65	.54	24	3.263*	.003
CG (cm)	Pre Post	29.48 ± 3.15 31.12 ± 2.98	.32	24	5.197*	.000
SH (cm)	Pre Post	83.36 ± 5.96 84.24 ± 5.64	.15	24	6.063*	.000

Significant at 0.05 level of confidence. RCont.- Rajbangsi control

Table-5 represents the comparison of means of selected anthropometric variables of RCont. group after the study. The t-value of HC, CC, UAG, TG, CG and SH were 4.437, 1.296, 6.124, 3.263, 5.197 and 6.063 respectively. The t-value of HC, UAG, TG, CG and SH were significant at 0.05 level of confidence.

TABLE: 6.Comparison of means of selected anthropometric variables between GExpt. and RExpt. Group before experimental period.

Parameters		Mean ± SD	SED	df	t	Sig (2-tailed)
HC (cm)	GExpt. RExpt.	52.96 ± 1.54 53.92 ± 1.19	.39	48	2.468*	.017
CC (cm)	GExpt. RExpt.	75.52 ± 5.16 77.40 ± 6.09	1.60	48	1.177	.245
UAG (cm)	GExpt. RExpt.	20.76 ± 1.76 21.52 ± 2.28	.58	48	1.320	.193
TG (cm)	GExpt. RExpt.	40.76 ± 3.50 41.40 ± 3.27	.96	48	.668	.507
CG (cm)	GExpt. RExpt.	29.20 ± 2.58 30.60 ± 2.29	.69	48	2.028*	.048
SH (cm)	GExpt. RExpt.	82.88 ± 4.29 86.56 ± 3.34	1.09	48	3.381*	.001

Significant at 0.05 level of confidence.

Table-6 represents the comparison of means of selected anthropometric variables between G Expt and R Expt group before experimental period. The t-value of HC, CC, UAG, TG, CG and SH were 2.468, 1.177, 1.320, .668, 2.028 and 3.381 respectively. The t-value of HC, CG, SH was significant at 0.05 level of confidence.

TABLE:7. Comparison of means of selected anthropometric variables between GExpt. and RExpt. Group after experimental period.

Parameters		Mean ± SD	SED	df	T	Sig (2-tailed)
HC (cm)	GExpt.	53.08± 1.53	.37	48	3.219*	.002
	RExpt.	54.28 ± 1.07				
CC (cm)	GExpt.	75.84 ± 5.68	1.57	48	1.172	.247
	RExpt.	77.68 ± 5.42				
UAG (cm)	GExpt.	21.96 ± 1.90	.56	48	1.416	.163
	RExpt.	22.76 ± 2.09				
TG (cm)	GExpt.	41.72 ± 3.58	.93	48	2.325*	.024
	RExpt.	43.88 ± 2.96				
CG (cm)	GExpt.	30.08 ± 2.34	.65	48	2.570*	.013
	RExpt.	31.76 ± 2.28				
SH (cm)	GExpt.	83.52 ± 3.70	.99	48	3.327*	.001
	RExpt.	86.84 ± 3.35				

Significant at 0.05 level of confidence.

Table-7 represents the comparison of means of selected anthropometric variables between G Expt. and R Expt. group after experimental period. The t-value of HC, CC, UAG, TG, CG and SH were 3.219, 1.172, 1.416, 2.325, 2.570 and 3.328 respectively. The t-value of HC, TG, CG, SH was significant at 0.05 level of confidence.

TABLE: 8. Comparison of means of selected anthropometric variables between GCont. and RCont. Group before study.

Parameters		Mean ± SD	SED	df	t	Sig (2-tailed)
HC (cm)	GCont.	52.16 ± 1.57	.50	48	1.695	.097
	RCont.	53.00 ± 1.91				
CC (cm)	GCont.	75.44 ± 4.57	1.35	48	1.632	.109
	RCont.	77.64 ± 4.95				
UAG (cm)	GCont.	20.00 ± 2.24	.68	48	.944	.350
	RCont.	20.64 ± 2.55				
TG (cm)	GCont.	38.92 ± 3.38	1.08	48	.930	.357
	RCont.	39.92 ± 4.18				
CG (cm)	GCont.	28.12 ± 2.45	.80	48	1.702	.095
	RCont.	29.48 ± 3.15				
SH (cm)	GCont.	80.12 ± 6.67	1.79	48	1.811	.076
	RCont.	83.36 ± 5.96				

Significant at 0.05 level of confidence.

Table: 8 represent the comparison of means of selected anthropometric variables between G Cont. and R Cont. group before study. The t-value of HC, CC, UAG, TG, CG and SH were 1.695, 1.632, .944, .930, 1.702 and 1.811 respectively.

TABLE: 9. Comparison of means of selected anthropometric variables between GCont. and RCont. Group after the study.

Parameters		Mean ± SD	SED	df	t	Sig (2-tailed)
HC(cm)	GCont. RCont.	52.28 ± 1.59 53.52 ± 1.61	.45	48	2.736*	.008
CC (cm)	GCont. RCont.	75.48 ± 5.87 77.88 ± 5.23	1.42	48	1.685	.098
UAG (cm)	GCont. RCont.	20.88 ± 2.09 21.64 ± 2.34	.63	48	1.211	.232
TG (cm)	GCont. RCont.	40.48 ± 3.00 41.68 ± 4.65	1.11	48	1.084	.284
CG (cm)	GCont. RCont.	29.00 ± 2.45 31.12 ± 2.98	.77	48	2.750*	.008
SH (cm)	GCont. RCont.	80.72 ± 6.43 84.24 ± 5.64	1.71	48	2.058*	.045

Significant at 0.05 level of confidence.

Table-9 represents the comparison of means of selected anthropometric variables between G Cont. and R Cont. group after the study. The t-value of HC, CC, UAG, TG, CG and SH were 2.736, 1.685, 1.211, 1.084, 2.750 and 2.058 respectively. The t-value of HC, CG, SH was significant at 0.05 level of confidence.

DISCUSSION:

The main essence of the present study was embodied on the effect of weight training among an ethnic community of North Bengal called ‘‘Rajbangsi” with distinctive physical features along with their observable physiognomy. Anthropometrically the Rajbangsi community is quite different from that of the General population due to specific physiognomy of a mixed breed of Koches and predominantly Mongoloid. In the present study head circumference of Rajbangsi students were significantly improved. The comparison in head circumference among GExpt and RExpt group showed significant increment in head circumference among RExpt group. The significant change is attributed due to the specific genetic factor among the Rajbangsi subjects and simultaneously training effect on the morphological profile of the Rajbangsi school going boys. The mean and standard deviation (SD) of upper arm girth of Shaber tribe boys in Orissa (14-16 years) were 20.1±2.3cm. 21.7±1.8cm. and 22.2±2.0cm. Respectively. (Chakraborty and Bharati, 2008). According to ICMR report the mean and SD of upper arm girth of boys (14-16 years) were 19.8±2.1cm. 20.2±2.3cm. and 21.1±2.2cm. Respectively. Considering the results of the present study it was noticed that the upper arm girth of Rajbangsi subjects was nearly similar as per the ICMR report of the same age group. In the present study upper arm girth was significantly improved among RExpt. as well as GExpt. Group. The result of the present study showed that 16 weeks weight training programme significantly improved the thigh of GR. So it would be easy to predict that GR was superior in improving thigh girth. After comparing the data for the experimental group before and after 16 week weight training programme, the increment in calf girth was significantly higher among RExpt. Group. This is due to genetic and morphological characteristics of the muscles of the calf of Rajbangsi subjects which indicates sound health

as well as proper nutrition. The mean and SD of sitting height of Japanese boys (14-16 years) were 86.65±4.27cm., 88.72±3.26cm. and 89.87±2.76cm. respectively. The mean and SD of sitting height of Shaber tribal of Orissa (14-16 years) were 72.7±3.6cm. 75.8±3.7cm. and 76.5±5.0cm. Respectively. From the finding of the present study it may be said that the sitting height of the Rajbangsi boys was higher than that of general subjects as well as from the Shaber tribal of Orissa but Japanese boys of the same age group were higher than that of Rajbangsi boys. After giving treatment programme sitting height was significantly higher among GR.

CONCLUSION:

The finding of the present study demonstrated that the head circumference, upper arm girth, thigh girth, calf girth and sitting height among Rajbangsi boys were significantly improved due to 16 weeks weight training programme. Based on the result of this study it may be concluded that the improvement in head circumference, upper arm girth, thigh girth, calf girth and sitting height were better among Rajbangsi group in comparison to General group.

Acknowledgements:

Researcher would like to thank his guide Prof. Kanchan Bandopadhyay and also thank to all the subjects who participate in this study.

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