

A Comparative Study

## Motor Fitness of Urban Tribal and Non-Tribal Boys of Tripura

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### ABSTRACT

*The aim of the present study was to identify the difference of motor fitness between urban tribal and non-tribal boys of Tripura. One hundred and fifty pre-pubertal tribal and non-tribal boys (Avg. age 12 yrs), and 150 post-pubertal tribal and non-tribal boys (Avg. age 15 yrs) were selected as sample. All tribal and non-tribal samples are selected from Agartala municipal area of West Tripura. Motor fitness test was administered to each subject.*

*Results revealed that both pre-pubertal and post-pubertal tribal boys were having significantly high speed and agility ( $P < 0.01$ ). In standing broad jump (SBJ), non-tribal boys were superior ( $P < 0.01$ ) in comparison to tribal boys which may be due to their short stature. Regarding sit and reach test, tribal boys showed significantly more flexibility compared to the non-tribal boys ( $p < 0.01$ ). Results indicated that tribal boys were much more fit than non-tribal boys in motor fitness except for the standing broad jump.*

### INTRODUCTION

Motor fitness refers to that neuro muscular condition that permits strenuous work; the basic components of motor fitness being such factors as strength—primarily as muscular endurance, speed, agility, endurance, power and flexibility. It entails the basic elements of vigorous physical activity. Generally, tests designed as physical fitness tests are actually tests of motor fitness. Physical fitness is generally used to

refer to the functional capacity of the individual for a specific task or mode of living. Motor fitness might be conceived as physical fitness in action, involving basically fundamental skills. Thus, motor fitness adds to the components of physical fitness; namely muscular strength and endurance and cardiovascular function, the factors of speed, agility, power and flexibility.

Children with good object control skills are more likely to become fit adolescents.

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Fundamental motor skill development, in childhood, may be an important component of interventions aiming to promote long-term fitness (Barnett *et al*, 2008). As an area of measurement, motor fitness represents an important consideration of overall appraisal; namely, the functioning of the individual that is fundamental to all physical activity. There is a dearth of research on motor performance of Tripura boys. Therefore, the purpose of the present study was to evaluate the motor fitness level of Tripura urban tribal and non-tribal boys, for the assessment of sports potentiality and talent.

## METHODOLOGY

### Subjects

One hundred and fifty pre-pubertal tribal and non-tribal boys (Avg. age 12 yrs), 150 post-pubertal tribal and non-tribal boys (Avg. age 15 yrs) were selected as sample for this cross-sectional study. Data was collected only from the different higher secondary schools situated in the Agartala Municipality Area, West Tripura. Stratified random sampling technique was used to collect data from different schools. The decimal age of the boys were calculated from their date of birth, recorded at the time of testing.

The pubertal stage was assessed according to the indices developed by Marshal & Tanner (1970), by averaging pubic hair ratings with genitalia ratings to find out the sexual maturity status of the boys. Based on the Marshal and Tanners' classification, we considered only 'stage 2' and 'stage 4' pubic hair and genitalia rating. The observed mean age at pubertal 'stage

2' was Average 12.0 years in the pre-pubertal boys and mean age at 'stage 4' was Average 15.0 years in the post-pubertal boys. The present cross-sectional study was conducted during the period 2006-2010.

The test items administered and the methods used are given below:

- a) Body height (cm): By anthropometric rod without shoes (Sodhi, 1991).
- b) Body weight (kg): By standard scale with light clothing without shoes (Sodhi, 1991).
- c) Speed (sec) : By sprint test (Rosch *et al*, 2000).
- d) Agility (sec) : By Shuttle run test (AAHPER, 1976)
- e) Leg power (m) : By standing broad jump (AAHPER, 1976)
- f) Flexibility (cm) : By sit and reach test (Johnson & Nelson, 1988)

### Statistical analysis

Mean, standard deviation and t-test were performed to see whether any significant differences existed between the tribal and non-tribal boys, in respect of anthropometry and motor performance. The study was conducted at 0.05 level of significance.

## RESULTS & DISCUSSION

Mean and Standard Deviation (SD) values of the anthropometry and motor tests of urban tribal and non-tribal boys are shown in Table 1 and 2. Significant difference was observed in

comparison between urban tribal and non-tribal boys in anthropometric variables and motor performance, at baseline ( $P < 0.05$ ). Mean values

of height and body weight were found to be significantly higher in non-tribal boys as compared to their counterparts.

**Table-1 : Comparison of the motor fitness of pre-pubertal tribal boys and non-tribal boys.**

Variables	Tribal boys (n= 150)	Non-Tribal boys (n= 150)	t-value with the level of significance
Age (yrs)	12.0 $\pm$ 0.8	12.2 $\pm$ 0.8	NS
Height (cm)	138.7 $\pm$ 6.0	141.6 $\pm$ 5.8	4.20**
Weight (kg)	28.2 $\pm$ 4.7	30.5 $\pm$ 5.1	3.99**
30 m sprint run (sec)	4.10 $\pm$ 0.35	5.00 $\pm$ 0.58	16.23**
Shuttle run (sec)	14.94 $\pm$ 0.41	16.10 $\pm$ 0.84	15.20**
SBJ (m)	1.63 $\pm$ 0.12	1.80 $\pm$ 0.19	8.05**
Sit and reach (cm)	12.0 $\pm$ 1.8	10.8 $\pm$ 1.7	5.56**

*Values are (mean $\pm$ SD); \*\*,  $P < 0.01$ ; SBJ, Standing broad jump*

**Table-2 : Comparison of the motor fitness of post-pubertal tribal boys and non-tribal boys.**

Variables	Tribal boys (n= 150)	Non-Tribal boys (n= 150)	t-value with the level of significance
Age (yrs)	15.5 $\pm$ 1.2	15.7 $\pm$ 1.2	NS
Height (cm)	158.0 $\pm$ 4.7	160.6 $\pm$ 4.6	4.82**
Weight (kg)	41.4 $\pm$ 4.0	43.2 $\pm$ 6.6	2.86**
30 m sprint run (sec)	4.85 $\pm$ 0.95	5.24 $\pm$ 0.65	4.01**
Shuttle run (sec)	14.15 $\pm$ 0.96	15.36 $\pm$ 0.65	12.79**
SBJ (m)	1.86 $\pm$ 0.22	2.10 $\pm$ 0.25	8.75**
Sit and reach (cm)	13.0 $\pm$ 1.3	11.4 $\pm$ 1.4	10.28**

*Values are (mean $\pm$ SD); \*\*,  $P < 0.01$ ; SBJ, Standing broad jump*

The results of this cross-sectional study showed that overall motor performance, except standing broad jump, of tribal boys was better

than non-tribal boys in both pre- and post-pubertal stage. It may be due to intensity of physical activity and lower body fat percentage

of tribal boys. A body having lower body fat percentage have better muscular strength and power per unit of body mass, because the percentage of lean body mass is higher; therefore, they perform better. Tribal boys achieved lower performance in standing broad jump which may be due their short stature.

#### **Sprint test measurement**

The 30 m sprint test was done to monitor the development of the child ability to effectively and efficiently build up acceleration, from a standing start or from starting blocks, to maximum speed. As compared to pre-pubertal ( $5.00\text{sec} \pm 0.58$ ) and post-pubertal non-tribal boys ( $5.24\text{sec} \pm 0.65$ ), pre-pubertal ( $4.10\text{sec} \pm 0.35$ ) and post-pubertal ( $4.85\text{sec} \pm 0.95$ ) tribal boys were significantly faster over 30 m sprint running. The degree of difference observed during pre-pubertal stage, between two groups, was 21.9 per cent while during post-pubertal stage these differences got reduced to 8.0 per cent. The speed is reduced at post-pubertal stage of tribal groups (18.2 per cent) and non-tribal groups (4.8 per cent) when compared with the value of pre-pubertal tribal and non-tribal groups (Table 1 & 2).

#### **Shuttle run measurement**

Shuttle run test was done to measure the agility of the children in running and changing direction. Results showed by pre-pubertal ( $14.94\text{sec} \pm 0.41$ ) and post-pubertal ( $14.15\text{sec} \pm 0.96$ ) tribal boys in shuttle run revealed that they were significantly faster ( $P < 0.01$ ) than pre-pubertal ( $16.10\text{sec} \pm 0.84$ ) and post-pubertal ( $15.36\text{sec} \pm 0.65$ )

non-tribal boys. The present sample of tribal and non-tribal boys performed better in shuttle run test in comparison to Chhattisgarh tribal ( $27.35\text{sec} \pm 1.65$ ) and non-tribal ( $29.39\text{sec} \pm 2.94$ ) boys (Agashe & Karkare 2003). Non-tribal boys have low performances in the shuttle run tests and this may be due to high proportional body weight. Halme, T. *et al.*, (2009) in their study, has shown that high body weight causes low performances in the shuttle run tests. The magnitude of difference observed during pre-pubertal stage between tribal and non-tribal was 7.7 per cent while during post-pubertal stage these differences increased to 8.5 per cent. The speed is reduced at post-pubertal stage of tribal groups (5.0 per cent) and non-tribal groups (4.5 per cent) when compared with the value of pre-pubertal tribal and non-tribal groups (Table 1 & 2).

#### **Standing broad jump ( SBJ ) measurement**

Standing broad jump was done to measure the explosive power of the legs of children. The present study reported that SBJ value was significantly lower in pre-pubertal ( $1.63\text{m} \pm 0.12$ ) and post-pubertal ( $1.86\text{m} \pm 0.22$ ) tribal boys in comparison to pre-pubertal ( $1.80\text{m} \pm 0.19$ ) and post-pubertal ( $2.10\text{m} \pm 0.25$ ) non-tribal boys. The underlying reason might be the shorter stature of tribal boys which had a negative influence on jumping ability (Malina & Buschang 1985). The magnitude of difference seen during pre-pubertal stage between tribal and non-tribal boys was 10.4 per cent and these differences increased to 12.9 per cent during post-pubertal stage. The power of the leg muscle is increased at post-pubertal

stage of tribal groups (14.1 per cent) and non-tribal groups (16.6 per cent) when compared with the value of pre-pubertal tribal and non-tribal groups (Table I & II).

#### Sit and reach test measurement

Flexibility, another very important component of health related physical fitness, is defined as the functional capacity of joint to move through full range of movement. The sit and reach test is a field test used to measure hamstring and low back flexibility (Baumgartner 1995).

Pre-pubertal ( $12.0\text{cm} \pm 1.8$ ) and post-pubertal ( $13.0\text{cm} \pm 1.3$ ) tribal boys exhibited superior sit and reach test score in comparison to pre-pubertal ( $10.8\text{cm} \pm 1.7$ ) and post-pubertal ( $11.4\text{cm} \pm 1.4$ ) non-tribal boys; and the difference was statistically significant ( $P < 0.01$ ). The magnitude of difference found during pre-pubertal stage between two groups was 10.0 per cent and these differences increased to 12.3 per cent during post-pubertal stage. The flexibility is reduced at post-pubertal stage of tribal groups (8.3 per cent) and non-tribal groups (5.5 per cent) when compared with the value of pre-pubertal

tribal and non-tribal groups (Table I & II). The children living in the urban areas were more inactive and obese, which resulted in a decrease in their flexibility and muscle endurance fitness (Ozdirenc, M. *et al*, 2005).

#### CONCLUSION

Tripura tribal boys are shorter and lighter than non-tribal counterpart both during pre- and post-pubertal stage, as per cross-sectional study. The results of the present study showed that tribal boys, in whole, achieved higher scores in motor performance and were more fit than the non-tribal boys, which may be due to social and economic factors, intensity of physical activity and participation in extra mural sports might have affected strength performance (Goslin & Burden, 1986). However, tribal boys achieved lower performance in standing broad jump which may be due to their short stature. In addition, normal fat content in non-tribal boys was greater in comparison to the tribal boys which has negative influence on motor performance, especially in those items in which the body moves or is projected (Beunen *et al*, 1983).

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