A STUDY ON STRIDE LENGTH IN INITIAL ACCELERATION PHASE FOR TRIBAL AND NON-TRIBAL SCHOOL BOYS

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Abstract:

In India, tribal is relating to a group of people or community of people belonging to tribes. The aim of the present study was to find out average stride length in initial acceleration phases for tribal and non-tribal boys during 100m sprinting. A total of 120 boys within the age groups of 10 to 15 yrs. were selected as subject for this study. The subjects were divided into three equal sized age groups i.e., 10-11 yrs., 12-13 yrs. and 14-15 yrs. Each group was consisted of 40 subjects, among them 20 tribal boys and 20 non-tribal boys. The video graphic data was collected from 100 m performance of the subject. The data was analyzed by motional analysis software Kinovea 0.8.15 from movement of two trials of the subject. The average stride length in initial acceleration phase for tribal boys group i.e. (10-11) yrs., (12-13) yrs. and (14-15) yrs. were 200.48 cm, 220.90 cm and 228.26cm whereas non-tribal boys were 208.66 cm, 226.87 cm and 231.07 cm respectively. The stride length increased with increase of age for tribal and non-tribal of both groups. The mean values of stride length were higher for the non-tribal group of subjects than their tribal counterparts for all age groups. The difference between tribal and non-tribal boys was statistically non-significant at 0.05 levels. The average stride length in initial acceleration phase increased with increase of age for both tribal and non-tribal boys. The stride length of non-tribal boys was higher than the tribal boys for all age groups. The difference between tribal and non-tribal boys was not statistically significant.

Keywords: stride length, tribal boys, non-tribal boys, initial acceleration phase

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1. Introduction

The definition of tribal (In Indian concept) is relating to a group or community belonging to tribes and the away that they are organized. Tribal group also called ethnic group of community. The tribal is relating to a community or group of people with ancestor, customs and traditions. The meaning of non-tribal is relating to a community or group of people who are not belonging to tribal community.

The term speed one generally gets the impression that we are talking about speed in running activities, but speed also concerns many body parts and varies from one part to another. Speed refers to quickness of action and one's ability to perform rapidly successive movements in a single direction. Speed is defined as *"one's ability to perform successive movements of the same pattern at a fast rate"*- (Barrow & McGee , 1979). Speed may also be defined as *"rapidity with which a movement or successive movements of the same kind may be performed by an individual"*.

The sprinting speed depends on some kinematic parameters such as stride length, stride frequency, body lean, front arm elbow angle, rear arm elbow angle etc. The only one kinematic parameter i.e. stride length in national acceleration phase consider for present study.

Speed is the function of stride length and frequency. Maximum speed depends on the ratio of these parameters. The increased of speed can be achieved by increasing stride length or stride frequency.

In sprinting maximum velocity is a key is a key determinant of running time- (Mastsuo, 2008). The maximum running velocity determines by stride length and stride frequency. *"The literature contains differing opinions with regards to the relative importance of developing a long step length and high step rate in sprint running. It is clear, however, that for sprint velocity to increase, step length, step rate, or both must increase"*- (Hunter, Marshall, & McNair, 2003).

In the present study distance covered by two steps consider as a stride length. *"Stride length is the distance covered between the spot where one foot hits the ground and the next time that same foot hits the ground again,"*- Robert Maschi (Clinical Associate Professor, Department of Physical Therapy and Rehabilitation Science, Drexel University and leader of Drexel's Running Performance and Research Center)- (Mateo, 2020). The video graphic data was collected during 100m sprinting. The stride length was calculated by motional analysis software Kinovea 0.8.15.

Purpose of research was to find out the average stride length in initial acceleration phase for tribal boys of 100m sprinting. The study also finds out the average stride length in initial acceleration phase for non-tribal boys of 100m sprinting and to compare the average stride length in initial acceleration phase for tribal and non-tribal boy's groups.

2. Methodology

Total 120 tribal and non-tribal boys within the age group of 10 to 15 yrs. were selected as subjects of this study. The subjects were divided into three equal sized age groups: 10-11 yrs., 12-13 yrs. and 14-15 yrs. Each age group was consisted of 40 subjects, among them 20 tribal and 20 non-tribal boys. Both the schools were collected from same locality at in West Bengal.

The video graphic data were collected from 100 m sprinting of subject. Here we considered only the data of initial acceleration phase i.e. (0-6) m. for the present study. The stride length in initial acceleration phase for tribal and nontribal boys were analyzed by motional analysis software Kinovea 0.8.15 from video graphic data. The video was recorded 60 frames per second by Nikon D3300 camera. The camera was placed at the height of 1m from ground and it was placed 6.25 m distance from the subject. The method shows in Figure 1 and Picture 1.

Figure 1: Method of data collection
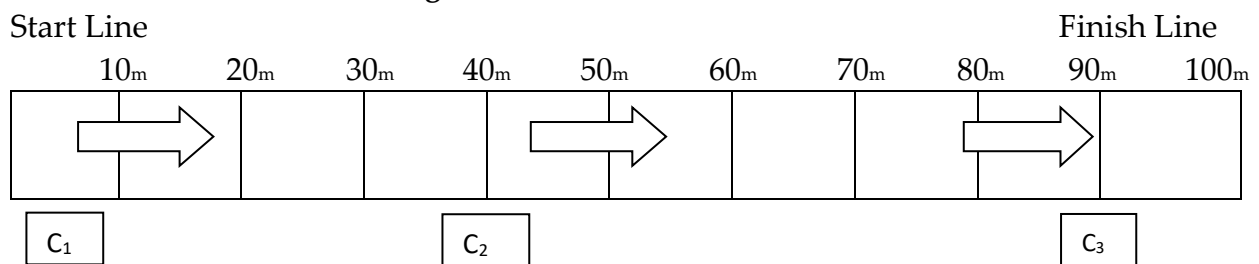
C1 = Video Camera no.1 (Placed at 3m end and Recording video: 0m-6m)
C2 = Video Camera no.2 (Placed at 40m end and Recording video: 36.5m-43.5m)
C3 = Video Camera no.3 (Placed at 90m end and Recording video: 86.5m-93.5m)
⟹ = Running away

Picture 1: Picture during data collection

Source: The authors' collection.

3. Results and Discussion

Keeping the focus of the study in mind, the stride length in initial acceleration phase (0-6) meter of different age groups of tribal and non-tribal subjects have been analyzed for better understanding. Mean values of average stride length in initial acceleration phase have been presented in Table 1.

Table 1: Stride length in initial acceleration phase (0m-6m)

Stride Length (cm)	10-11 yrs.		12-13 yrs.		14-15 yrs.	
	Tribal	Non-Tribal	Tribal	Non-Tribal	Tribal	Non-Tribal
Mean	200.48	208.66	220.90	226.87	228.26	231.07
SD	± 31.37	± 12.90	± 30.63	± 12.42	± 14.95	± 11.91

It is seen from the table value that the stride length in acceleration phase increased with increase of age for both tribal and non-tribal groups. Thus, mean values of stride length increased for tribal groups from 200.48 cm to 220.90 cm with increased of age from (10-11) yrs. to (12-13) yrs. for tribal boys. Subsequently the mean value of stride length increased further 220.90 cm to 228.26 cm with increase of age from (12-13) yrs. to (14-15) yrs. tribal boys. Similarly mean values of stride length increased for non-tribal group increased from 208.66 cm to 226.87 with increase of age of (10-11) yrs. to (12-13) yrs. non-tribal boys. The mean values of stride length further increased 226.87 cm to 231.07 cm with increase of age from (12-13) yrs. to (14-15) yrs. non-tribal boys. It is also seen that the mean values of stride lengths were higher for the non-tribal group of subjects than their tribal counterparts for all age groups.

From the above information average stride length in initial acceleration phase for tribal and non-tribal boys drawn in Figure 2.
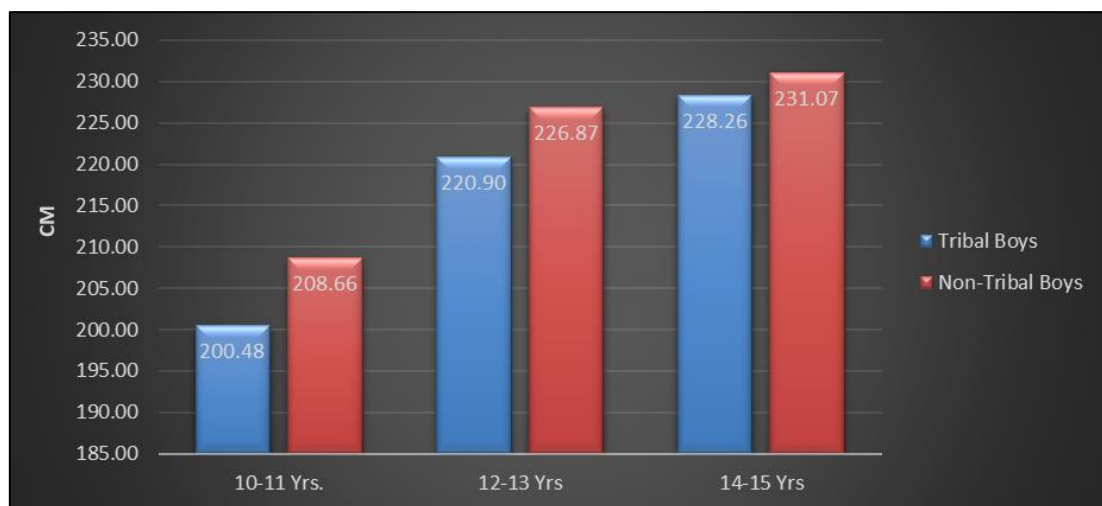

Figure 2: Average stride length in initial acceleration phase for tribal and non-tribal boys

From the Figure 2, it was observed that the stride length in initial acceleration phase for tribal and non-tribal boys was increased with increase of age. It is also seen that

the stride length of non-tribal boys group was higher than their tribal counterparts for all age group of subjects

Testing significant difference of stride length for tribal and non-tribal boys was done by t-test and the results have been shown in Table 2.

Table 2: Comparison of mean values of stride length in initial acceleration phase (0m-6m)

Group		Mean (cm)	SD (cm)	t-value	Remarks
10-11 Yrs.	Tribal	200.48	± 31.37		*Statistically significant at 0.05 level.
	Non-Tribal	208.66	± 12.90	1.05**	
12-13 Yrs.	Tribal	220.90	±30.63		
	Non-Tribal	226.87	±12.42	0.79**	**Statistically non-significant at 0.05
14-15 Yrs.	Tribal	228.26	±14.95		levels.
	Non-Tribal	231.07	±11.91	0.64**	
Required table value with df-19 = 2.09, Significant level = 0.05					

It is seen from the table value that the calculated t-value for 10-11 yrs., 12-13 yrs. and 14-15 yrs. group tribal and non-tribal boys was 1.05, 0.79 and 0.64 respectively whereas the table value was 2.09 (df= 19) at 0.05 level of significant.
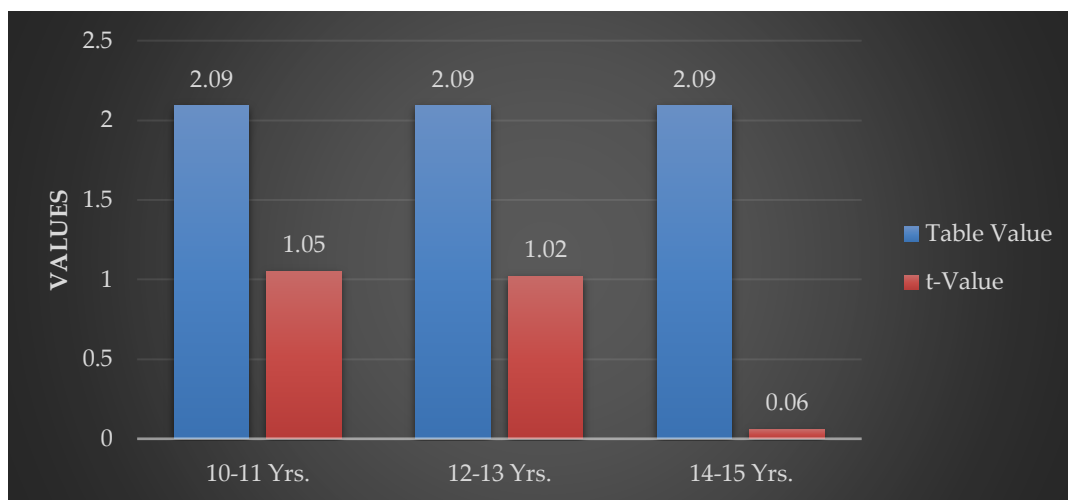

Figure 3: Comparison of stride length in initial acceleration phase (0.05 level)

Figure 3 shows that calculated t-value is lower than the table value at 0.05 level (df-19=2.09). Significance of the difference between mean values of stride length for tribal and non-tribal boys revealed a statistically non-significant difference at 0.05 level of significant for different age group. A few researchers found difference of stride length between tribal and non-tribal. But my study differences are not found statistically significant. It's happed due to the subject they are not trained for sprinting, and their socio-economic, culture and active participation of daily lime similar for both tribal and non-tribal boys.

4. Conclusions

On the basis of results present study for tribal and non-tribal boys for different age groups with existing limitation of the study following conclusions were drawn:

1) The average stride length for tribal boys in initial acceleration phase increased from 208.48 cm to 220.90 cm with increase of age for (10-11) yrs. to (12-13) yrs. and further it was increased from 220.90 cm to 228.26 cm increase of age (12-13) yrs. to (14-15) yrs.

2) The average stride length for non-tribal boys in initial acceleration phase increased from 208.66 cm to 226.87 cm with increase of age for (10-11) yrs. to (12-13) yrs. and further it was increased from 226.87 cm to 231.07 cm increase of age (12-13) yrs. to (14-15) yrs.

3) The average stride length in initial acceleration phase for non-tribal boys was higher than the tribal boys in all counter parts. The difference between tribal and non-tribal boys was statistically not- significant at 0.05 level for all age group of subjects.

About the Authors

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