

## **Comparison of Selected Physical Fitness Components between Bangladeshi and Indian Girls Aged 7 To 9 Years Old**

Shekhar Mondal<sup>1</sup>, Dr. Sagarika Bandyopadhyay<sup>2</sup>

<sup>1</sup> Research scholar, Department of Physical Education, Visva-Bharati University, Santiniketan-741235, India.

<sup>2</sup> Professors, Department of Physical Education, Visva-Bharati University, Santiniketan-741235, India.

---

**Abstract:** The aim of this study was to compare the selected physical fitness components between Bangladeshi and Indian girls aged 7 to 9 years old. The study was conducted on 107 Indian girls and 104 Bangladeshi girls for the comparison of selected physical fitness variables. The selected variables for the study were upper body strength endurance (flex arm hang), agility (4x10 m. shuttle run) and cardiovascular endurance (Reduced cooper test). T-test was used to find out the significant difference among different disciplines. It was concluded that there was significant difference between Indian and Bangladeshi girls in strength endurance (upper body). But the significance differences were not found on agility and cardiovascular endurance variables. Indian girls have better agility and cardio respiratory endurance than Bangladeshi girls but Bangladeshi girls have better upper body strength endurance than Indian girls.

**Keywords:** strength endurance, agility, cardiovascular endurance and BMI.

---

### **I. Introduction**

Being physically fit means having the strength and endurance to carry-out every day activities without undue stress and still have enough energy to participate in leisure activities and be able to deal with an unexpected emergency. During last century the concept of fitness in general and physical fitness in particulars has undergone several changes. At present fitness is understood as a total concept expressing the ability or preparedness of an individual is to do some task. Physical fitness is a part of total fitness and similarly the motor fitness is a part of physical fitness. Motor fitness is an important part in games and sports. Motor fitness and Body Mass Index both expresses nutritional status as well as health status of an individual.

A health-related physical education curriculum can provide students with substantially more physical activity during physical education classes. Improved physical education classes can potentially benefit 97% of elementary school student [1]. Women with FM had physical activity levels similar to women without FM but exhibited worse physical performance. This functional impairment may be related to lifestyle adopted because there was a relationship between physical activity level and physical performance in those patients [2]. As the foot type, in sport, is strictly associated to recurrent injuries, the result obtained in this study should be considered as indicative for future analysis. In fact, a clear and univocal knowledge of this phenomenon would be useful in the planning of a training protocol to reduce the incidence of sport related injuries [3]. The older subjects did not reduce self-selected walking speed relative to the younger subjects. However, the walking speed was maintained by increasing cadence while reducing stride-length for middle-aged and older subjects. Middle-aged and older adults had less ankle dorsi-flexion landing at heel-strike and older adults also had less plantar flexion at toe-off. Small decreases in the ankle dorsi-flexion moments ( $p=0.019$ ,  $p=0.008$ ) and increases in the hip extension moments ( $p=0.004$ ,  $p=0.005$ ) were found for two normalized walking speeds for the middle-aged and older adults compared to the young adults. These results provide quantitative evidence that increased activity with aging can mitigate declines in walking performance and mechanics with age. The high volume of walking activity in the older subjects did not fully prevent changes in gait mechanics, but may have minimized the magnitude of age-related changes on ambulatory function relative to other reports of older inactive subjects [4]. Physical activity (PA) in children has declined in recent decades, highlighting the need for effective intervention programs for school-aged children. To assess to what extent PA during and after school hours changed among children who received a progressive two-year long intervention vs. that of children who only received general curriculum-based PA. A cluster randomized intervention study was conducted and six elementary schools randomly assigned to serve as control- or intervention schools. All children attending second grade (mean age = 7.4 years - born in 1999) were invited to participate in the fall of 2006 ( $N = 320$ , 82% participated), again in 2007 (midpoint) and 2008 (end of intervention). The intervention consisted of multi-component PA-intervention during school hours and was conducted by teachers at each intervention school. PA was assessed by means of accelerometers and subjectively at the intervention schools via teachers' PA log-books. The results suggest that the objective of increasing PA at school was met after one year of intervention, and it was more pronounced among boys. The lack of increase at the end of the study period suggested that any

increase in PA during school may highly depend on both motivation and training of general teachers. Boys may respond better to PA interventions such as the one described in this study [5].

The age-related changes in 100-km running performance compared between males and females. For both sexes, the percent of finishers significantly ( $P < 0.01$ ) decreased for the 18-29 and the 30-39-year age groups, while it significantly ( $P < 0.01$ ) increased for the 40-49 and the 50-59-year age groups over the studied period. From 1998 to 2010, the mean age of the top ten finishers increased by 0.4 years per annum for both females ( $P = 0.02$ ) and males ( $P = 0.003$ ). The running time for the top ten finishers remained stable for females, while it significantly ( $P = 0.001$ ) increased by 2.4 min per annum for males. There was a significant ( $P < 0.001$ ) age effect on running times for both sexes. The best 100-km running times was observed for the age comprised between 30 and 49 years for males, and between 30 and 54 years for females, respectively. The age-related decline in running performance was similar until 60-64 years between males and females, but was greater for females compared to males after 65 years. Future studies should investigate the lifespan from 65 to 75 years to better understand the performance difference between male and female master ultra-marathoners [6]. Morbidly obese individuals have severely reduced cardiorespiratory fitness that is similar to those with established systolic dysfunction heart failure. In addition, in those persons who are referred for stress testing for medical reasons, there is an inverse graded relationship between BMI and cardiorespiratory fitness. These data suggest that the impairment in  $\dot{V}O_2$  max in morbidly obese persons is related to BMI and possibly to other factors that impair peak cardiac performance. These findings are consistent with overall higher expected mortality in morbidly obese persons [7].

Rampinini E. et al (2009) investigated the repeated-sprint ability (RSA) physiological responses to a standardized, high-intensity, intermittent running test (HIT), maximal oxygen uptake  $\dot{V}O_2$  (max) and oxygen uptake ( $\dot{V}O_2$ ) kinetics in male soccer players (professional ( $N = 12$ ) and amateur ( $N = 11$ )) of different playing standards. The relationships between each of these factors and RSA performance were determined. The results show that RSA performance, the physiological response to the HIT, and differentiate between professional- and amateur-standard soccer players. Their results also show that RSA performance is related to  $\dot{V}O_2$  max, tau, and selected physiological responses to a standardized, high-intensity, intermittent exercise [8].

Knechtte, B et al (2009) investigated the participation and performance trends at the '100 km Lauf Biel' in Switzerland from 1998 to 2010, and (2) to compare the age-related changes in 100-km running performance between males and females. The best 100-km running times was observed for the age comprised between 30 and 49 years for males, and between 30 and 54 years for females, respectively. The age-related decline in running performance was similar until 60-64 years between males and females, but was greater for females compared to males after 65 years. Future studies should investigate the lifespan from 65 to 75 years to better understand the performance difference between male and female master ultra-marathoners [9].

Physical performance often declines in middle age, but it is unclear to what extent this is due to biological aging. It can be difficult to determine whether such physical changes are truly age-related, as they might alternatively be explained as the negative consequences of a sedentary lifestyle. Performance losses in middle age are mainly due to a sedentary lifestyle, rather than biological aging. The large contingent of older "newcomers" among marathon runners demonstrates that, even at an advanced age, non-athletes can achieve high levels of performance through regular training [10].

## **II. Methodology**

### **2.1 Selection of Subjects**

104 girls from Bagerhat district in Bangladesh and 107 girls from Purulia and Midnapur district in West Bengal were selected aged 7 to 9 years old. All subjects were arranged in a randomly. Total subjects were 211 and all of the subjects live at village. All of the 211 girls were born in daily labour or peasant family. 107 Indian girls who went to school also play in the fields in the afternoon. But 104 Bangladeshi girls were less involved in games. They help their parents in the field for cultivation.

### **2.2 Selection of the Variables and criterion measures**

Following variables were selected for the purpose of the study:

#### **2.2.1 BMI**

#### **2.2.2 Flex arm hang for upper body strength endurance (in Seconds)**

#### **2.2.3 4x10 m. shuttle run- for Agility (in Seconds).**

#### **2.3.4 Reduced cooper test for Cardiovascular Endurance (in Meter).**

### **2.3 Statistical Technique**

Mean, Std. Deviation and t-test were used to find the significant difference between the two groups. The level of significance was set at 0.05. The data was calculated by using SPSS statistical software.

**III. Result And Discussion**

After collection of data from all of 211 subjects were then put into statistical analysis. Mean, Standard Deviation, Std. Error Mean and ‘T’-test were used as statistical analysis which were presented in the Table-1 and Table-3. The mean values of strength endurance, agility and cardiovascular Endurance of Indian girls are 13.04 sec, 13.29 sec and 1024.36 m. On the other hand, the mean values of strength endurance, agility and cardiovascular endurance of Bangladeshi girls are 17.81 sec, 13.52 sec and 1012.75 m respectively in the Table-1. The result of the present study revealed that significance difference was found on upper body strength endurance. But the significance differences were not found on agility and cardiovascular endurance in ‘T’ test of Table-3. Indian girls have better agility and cardiovascular endurance than Bangladeshi girls but the agility and cardiovascular endurance are little difference between them. The comparison of mean difference of cardiovascular endurance between Indian and Bangladeshi girls is presented in Fig-3. Bangladeshi girls have better upper body strength endurance than Indian girls due to less weight in Fig-2. The Comparison of mean difference in agility (shuttle run) and strength endurance (flex arm hang) has showed in Fig-2.

**Table-1**

Group Statistics						
	1=India,2=Bangladesh	N	Mean	Std. Deviation	Std. Error Mean	
Flex arm hang	1	107	13.0467	12.86606	1.24381	
	2	104	17.8173	14.31597	1.40380	
Shuttle run	1	107	13.2958	1.04776	10129	
	2	104	13.5282	.87053	.08536	
Reduced cooper test	1	107	1024.3645	104.47121	10.09961	
	2	104	1012.7596	80.26322	7.87046	

The mean of age, weight and height of Bangladeshi girls were 7.7596 years, 20.29 kg and 121.78 cm but the mean of age, weight and height of Indian girls were 7.8037 years 22.96 kg and 123.73 cm respectively. Bangladeshi girls have lesser weight than Indian girls. Bangladeshi girls have better upper body strength endurance than Indian girls due to less weight. As a result BMI of Bangladeshi girls have lesser than Indian girls also in Fig-1. The comparison of mean difference of BMI between Indian and Bangladeshi girls has given in Fig-1. BMI of Indian and Bangladeshi girls are 14.80 kg/m<sup>2</sup> and 13.74 kg/m<sup>2</sup> respectively. The mean and SD of age, height, weight and BMI of Indian and Bangladeshi children has been given in Table-2.

**Table-2**

Group Statistics						
	1=India,2=Bangladesh	N	Mean	Std. Deviation	Std. Error Mean	
Age	1.00	107	7.8037	.69281	.06698	
	2.00	104	7.7596	.70360	.06899	
Height	1.00	107	123.7383	8.65408	83662	
	2.00	104	121.7885	7.33349	71911	
Weight	1.00	107	22.9626	4.98947	48235	
	2.00	104	20.2933	3.51461	34464	
BMI	1.00	107	14.8008	1.60892	15554	
	2.00	104	13.7462	1.77842	17439	

**Table-3: Analysis of t-test**

		Lemene’s t-test for Equality of Variances		t-test for Equality of Means						
		F	Sig.	t	df	Sig.(t-tailed)	Mean difference	Std. Error difference	95% confidence Interval of the difference	
									Lower	Upper
Flex arm hang	Equal Variances Assumed	1.022	.313	-2.547	209	.012	-4.77058	1.87271	-8.46239	-1.07876
	Equal Variances not Assumed			-2.544	205.271	.012	-4.77058	1.87555	-8.46840	-1.07276
Shuttle run	Equal Variances Assumed	0.578	.448	-1.750	209	.082	-.23238	.13281	-.49420	.02944
	Equal Variances not Assumed			-1.754	204.090	0.81	-.23238	.13246	-.49355	.02879
Reduced cooper test	Equal Variances Assumed	8.673	.004	.903	209	.368	11.60487	12.85137	-13.73005	36.93979
	Equal Variances not Assumed			.906	198.499	.366	11.60487	12.80415	-13.64475	36.85449

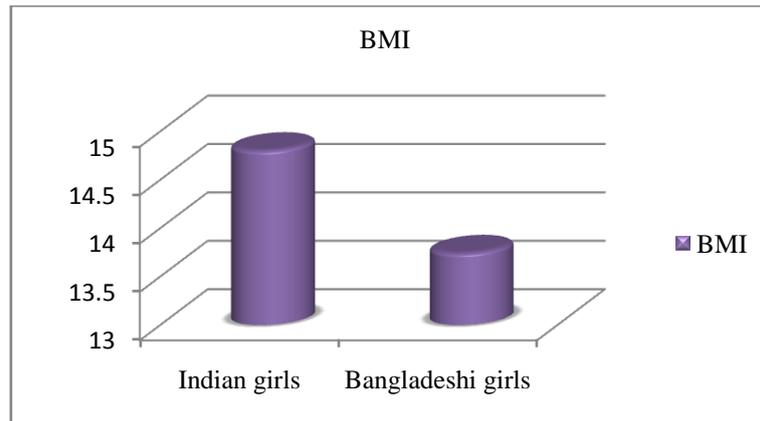


Fig-1: Comparison of mean difference of BMI between Indian and Bangladeshi girls.

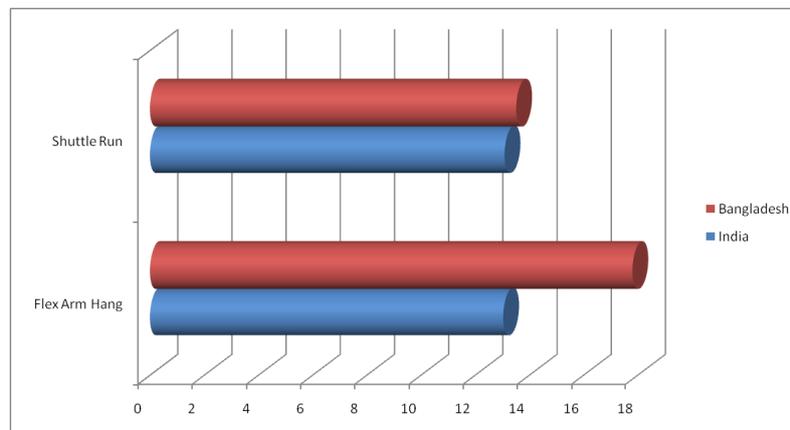


Fig-2: Comparison of mean difference in agility (shuttle run) and strength endurance (flex arm hang)

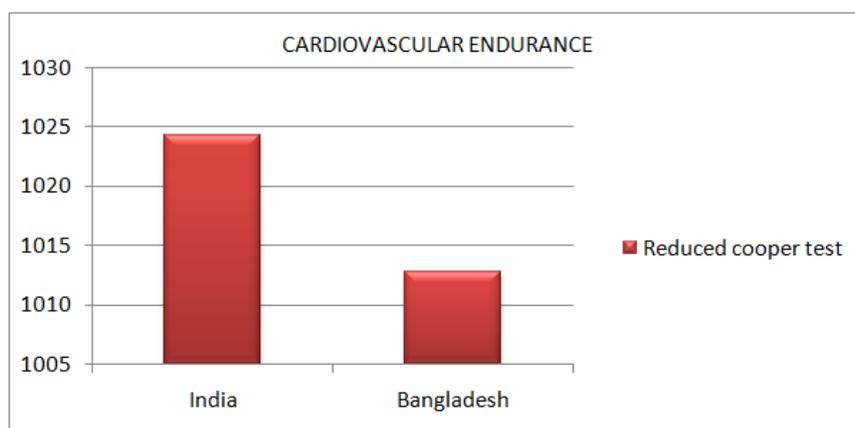


Fig-3: Comparison of mean difference in cardiovascular endurance (Reduced cooper test)

#### IV. Conclusion

On the basis of the result it can be concluded that Indian girls have better agility and cardiovascular endurance than Bangladeshi girls. But the agility and cardiovascular endurance are less difference between Indian and Bangladeshi girls. Bangladeshi girls have lower BMI than Indian girls. As a result Bangladeshi girls have better upper body strength endurance than Indian girls due to less weight.

#### Acknowledgements

We gratefully thank Sri Achyut Kumar Banerjee for his statistical assistance, Sri Khitish Chandra Mondal who helped in the organization of the study and Sri Sabuj Roy who recorded the measurements. Thanks are also expressed to Sri Sudhangshu Shekhar Roy and Sri Chinmoy Mondal for rendering assistance to the administration of the test.

### References

- [1]. Sallis, J. F., McKenzie, T. L., Alcaraz, J. E., Kolody, B., Faucette, N., & Hovell, M. F. (1997). The effects of a 2 year physical education program (SPARK) on physical activity and fitness in elementary school students. *American Journal of Public Health* , 87 (8), 1328-1334.
- [2]. Breda, C. A., Rodacki, A. L., Leite, N., Homann, I., Goes, S. M., & Stefanello, J. M. (n.d.). Physical activity level and physical performance in the 6-minute walk test in women with fibromyalgia . *Revista brasileira de reumatologia* .
- [3]. Mantini, S., Bruner, E., Colaiacomo, B., Ciccarelli, A., Redaelli, A., & Ripani, M. (2012). Preliminary baropodometric analysis of young soccer players while walking: geometric morphometrics and comparative evaluation. *The Journal of sports medicine and physical fitness* , 52 (2), 144-50.
- [4]. Boyer, K. A., Andriacchi, T. P., & Beaupre, G. S. (2012). The role of physical activity in changes in walking mechanics with age. *U S National Library of Medicinenational Institute Health* , 36 (1), 149-53.
- [5]. Magnusson, K. T., Sigurgeirsson, I., Sveinsson, T., & Johannsson, E. (2011). Assessment of a two year school based physical activity intervention among 7-9 years old children. *International journal of behavioral nutrition and physical activity* , 8 (138), 1478.
- [6]. Sandbakk, Q., Welde, B., & Holmberg, H. C. (2011). Endurance training and sprint performance in elite junior-cross-country skiers. *Journal of strength and conditioning research / national strength and conditioning association* , 25 (5), 1299-350.
- [7]. Gallagher, M. J., Franklin, B. A., Ehrman, J. K., Keleyian, S. J., Brawner, C. A., de Jong, A. T., et al. (2005). Comparative impact of morbid obesity VS hearth failure on cardiorespiratory fitness. *U S National Library of Medicinenational Institute of Health* , 127 (6), 2197-203.
- [8]. Rampinini, E., Sassi, A., Morelli, A., Mazzoni, S., Fanchini, M., & Coutts, A. J. (2009). Repeated-sprint ability in professional and amateur soccer players. *U S National Library of Medicinenational Institute of Health* , 34 (6), 1048-54.
- [9]. Knechtte, B., Rust, C. A., Rosemann, T., & Lepers, R. (2012). Age-related changes in 100 KM ultramarathon running performance. *U S National Library of Medicinenational Institute of Health* , 34 (4), 1033-45.
- [10]. Leyk, D., Ruther, T., Wunderlich, M., Sievert, A., Essfeld, D., Witzki, A., et al. (2010). Physical performance in middle age and old age: good news for our sedentary and aging society. *U S National Library of Medicinenational Institute of Health* , 107 (46), 809-16.
- [11]. Datt, V., & Mane, M. (2013). A comparative study of speed, strength and agility of Inter Collegiate Basketball and volleyball players. *Variorum Multi-Disciplinary e-Research Journal* , 04 (II), 1-5.
- [12]. Gour, M. (2013). A comparative study physical fitness between basketball and hockey players of Utter Pradesh. *International Journal of physical education,health & sports science* , 2 (1), 50-54.