

Impact of Receiving Training in Football on Body Physique and Fitness Status of Adult Bengalee Males

Bhattacharjee Satabdi, Banerjee Neepa, Chatterjee Surjani, Chatterjee Sandipan, Chatterjee Ayan, De Santanu, Mukherjee Shankarashis
Human Performance Analytics and Facilitation Unit, Department of Physiology,
University Colleges of Science and Technology, University of Calcutta
RashbehariShikshaPrangan, 92 AcharyaPrafulla Chandra Road, Kolkata 700 009, India
*Email: msashis@yahoo.co.in

Abstract: Football- a popular team game-is a form of physical exercise characterized by high intensity activities depending heavily on aerobic endurance and short-term, intermittent actions, requiring higher levels of strength and flexibility. During the game, players are required to perform different kind of essential technical and tactical movements, which may be associated with beneficial bodily changes. In this backdrop, a study has been undertaken on adult Bengalee male individuals (age 18-30years) to assess the effect of receiving training on football, for at least a period of 4 years regularly, on the body physique and fitness status. The study was carried out on 35 male volunteers (age 18 – 30 years) constituting exercising group (EG). Selected anthropometric parameters and skin fold measurements were taken to access body physique status and to access fitness, handgrip, pinch strength and lower back and hamstring flexibility were estimated. Similar measurements were taken from 38 individuals of comparable age, socioeconomic and ethnic background without any training in any form of exercise including football constituting the control group (CG). The result of the present study revealed that individuals receiving training in football have significantly favorable ($P < 0.05$) body physique status and better ($P < 0.05$) strength and flexibility, compared to their age and sex matched CG counterparts.

1 INTRODUCTION

Physical fitness is important at all levels of the game [11]. Physical fitness of an individual can be determined by different parameters including anthropometric parameters [8,9,14]. Not only that strength and flexibility are also recognized as important indicators of physical fitness status. On the other hand, higher levels of flexibility is attributed to greater capacity to do physical performance and poor flexibility is related to injury in several musculotendinous units, including the Achilles tendon, plantar fascia, and hamstring tendons[10]. Football or Soccer - is one of the most popular team sports all over the world characterized by high intensity activities depending heavily on aerobic endurance and short-term, intermittent actions, having numerous short, explosive exercises burst interspersed with brief recovery periods over an extended period of time (90 minutes). During the game, players are required to perform different kind of activities including jogging, running (forward, backward and sideways), kicking, turning, heading and throwing. The exercise pattern of football can be described as dynamic, random and intermittent. It also requires some essential technical and tactical skills. As in other team sports, football involves different playing positions with different physical and physiological attribute needs in order to make a continuous and



successful performance. In this backdrop, a study has been undertaken on adult Bengalee male individuals (age 18-30 years) to assess the effect of receiving training on football for at least a period of 4 years regularly, on body physique and fitness status.

2 METHODOLOGY

Organizations imparting training on football were approached for required permission to carry out a study on the male individuals receiving training in football. After initial discussion, few centers were shortlisted. 35 (18-30 years aged) randomly selected individuals receiving training in football for at least a period of 4 years and practicing at least 6 days a week, with no chronic disease history (self-reported) were included for the present study and constituted Exercising Group (EG). Initially age (years), socio-economic background, daily football practicing time and playing position of the individuals were recorded in the pre-designed schedule. Body height (cm) was measured (to the nearest 0.1 cm) using anthropometric measurement set and body weight (kg) was measured (to the nearest 0.1 kg) using an electronic weighing scale with individuals without shoes and in light clothing. BMI ($\text{kg}\cdot\text{m}^{-2}$) was calculated [4]. Fat mass (kg) of the subjects were calculated from the skin fold measurements taken at biceps, triceps, subscapular, suprailliac and calf [11]. To assess the body physique status, anthropometric parameters - waist circumference (WC), hip circumference (HC), mid upper arm circumference (MUAC), neck circumference (NC) were recorded using a non-stretchable measuring tape and waist to hip ratio (WHR) [7], waist to height ratio (WHtR) [2] were calculated. Handgrip strength was measured [15] using the Handgrip Dynamometer in vertically downward and horizontal position for both right and left hand; pinch strength was measured using pinch gauge. Lower-back and hamstring flexibility was measured by means of Sit and Reach Test [1]. Similar measurements were taken from 38 individuals, of comparable age, socioeconomic and ethnic background without formal training in any form of exercise including football, constituting the control group (CG). On obtaining the measurements, the data were subjected to statistical analyses and $P < 0.05$ was chosen as the level of significance.

3 RESULTS

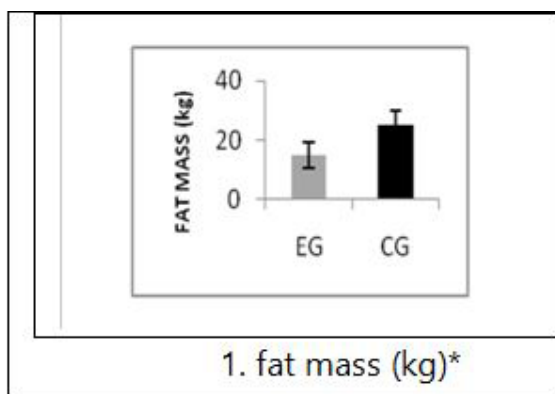
The physical and basic anthropometric parameters of the study participants of EG and CG individuals are presented in table 1.

Table 1 Basic characteristic of study participants

| Variables | Exercising group (EG) | Control group (CG) |
|----------------------|-----------------------|--------------------------|
| Age [^] | 23.6 ± 5.90 | 23.2 ± 5.93 [^] |
| Waist circumference* | 76.1 ± 5.57 | 88.0 ± 7.48 |
| Hip circumference * | 90.0 ± 6.89 | 95.0 ± 3.61 |
| Neck circumference * | 34.8 ± 1.84 | 35.0 ± 1.81 [^] |

[^] ns, * $P < 0.05$

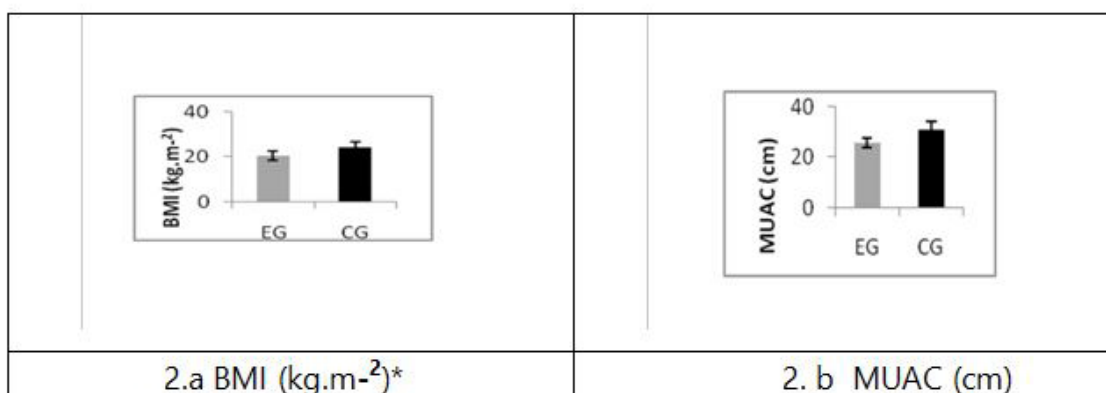
In figure 1 body composition parameter in terms of fat mass of EG and CG individuals have been graphically presented:



P<0.05*

Figure1. Comparison between EG and CG individuals in respect of fat mass

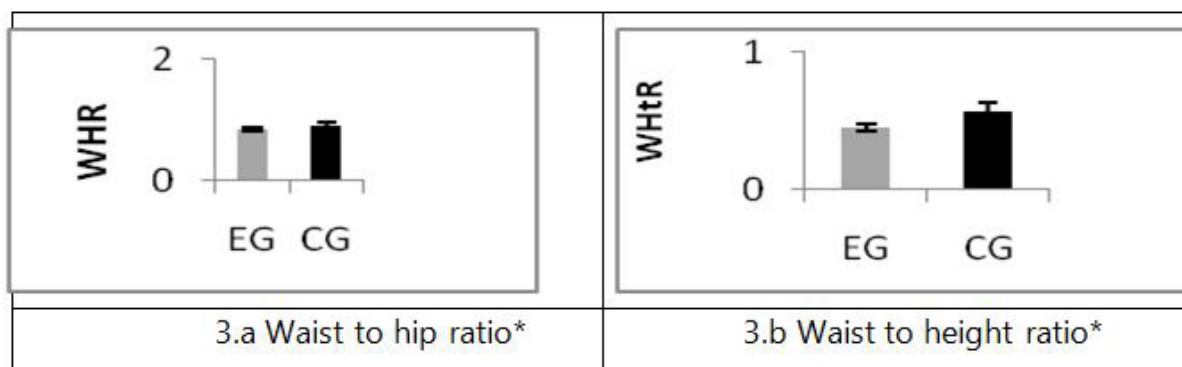
In figure 2a and 2b body physique status in terms of BMI (kg.m⁻²) and MUAC (cm) has been graphically presented:



P<0.05*

Figure2: Comparison between EG and CG individuals in respect of BMI and MUAC

In fig 3a and 3b body physique status in terms WHR and WHtR has been graphically presented.

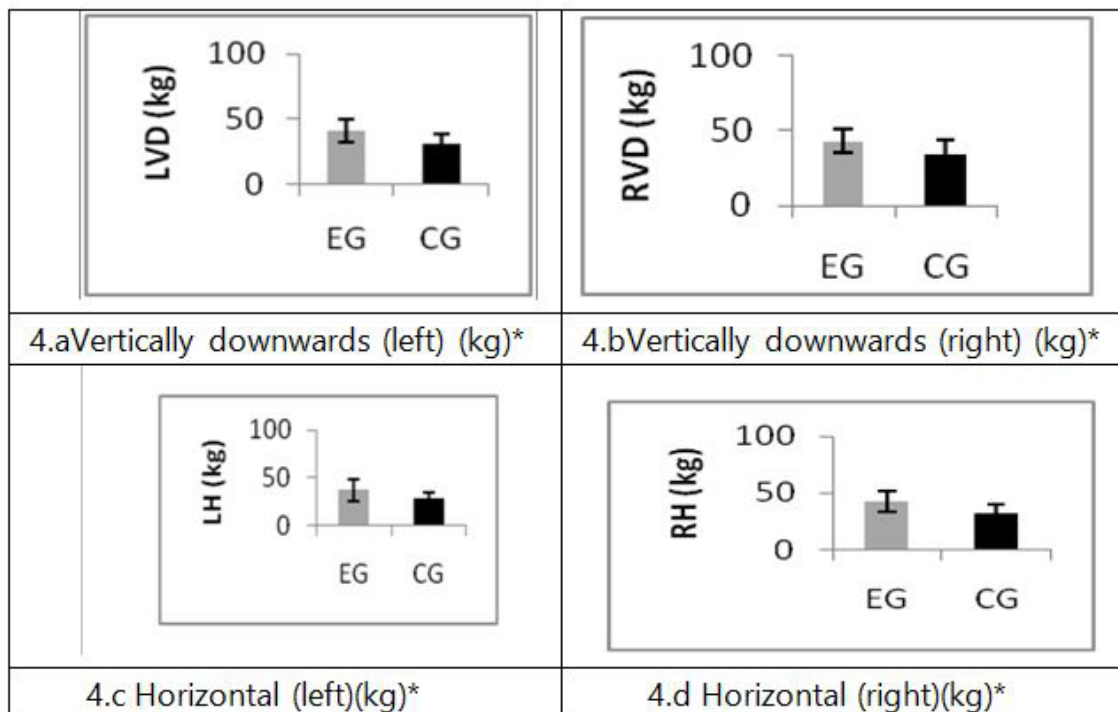


P<0.05*

Figure3. Comparison between EG and CG individuals in respect of WHR and WHtR



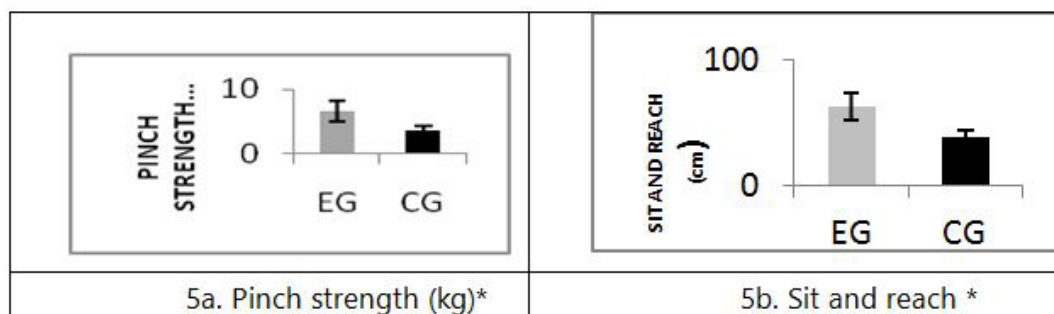
In figure 4a, 4b, 4c and 4d strength in terms of handgrip strength in vertically downwards, and horizontal position in both hands of EG and CG individuals has been graphically presented.



P < 0.05*

Figure 4: Comparison between EG and CG individuals in respect of handgrip strength in two different positions

In figure 5a pinch strength (kg) and in fig 5b, Sit and Reach (cm) of EG and CG individuals has been graphically presented



P < 0.05

Figure 5. Comparison between EG and CG individuals in respect of pinch strength and Sit and Reach test

4 DISCUSSIONS

It has been found in the present study that EG and CG individuals were comparable in terms of age but differ significantly ($P < 0.05$) in terms of body height, body weight and in basic anthropometric parameters including WC, HC and NC. Considering the central

adiposity indices, the recommended cutoff value for WC is 90 cm for Asian men(19); in the present study it has been found that the average value of WC in CG individuals (88 cm) is significantly higher than their EG counterparts (76.1 cm) but below the threshold level. Lower score in terms of HC and NC have also been found in EG individuals compared to the CG males; present findings are in agreement with previous study [5].Presently it has been established that Obesity, an "escalating epidemic"(18) and related co-morbidities occurred due to over accumulation of body fat and therefore body composition status in terms of body fat mass assessment is important and in the present study it has been found that EG individuals have lower mean value of fat mass (kg) compared to the CG individuals (fig: 1). Earlier studies have also found that receiving training in football is beneficial for maintaining lower body fat level (3); similarly light intensity Indian classical dance also has beneficial impact regarding maintaining favorable body fat (12,13,14).BMI (expressed in kg.m⁻²) is the most commonly used indicator of obesity. It has been found that the mean value of BMI in EG individuals is 20.5 (fig: 2.a) whereas CG individuals have mean value of BMI 24.3which is above the cut off value for being referred to as overweight for Asians, it may be due to leading sedentary lifestyle, a major risk factor of developing cardiovascular disease (4); similar finding has also been found when BMI was compared between individuals regularly practicing Indian classical dance and individuals leading physically inactive lifestyle. It has also been found in present study that MUAC (fig: 2b) of the EG individuals is significantly lower ($P<0.05$) compared to the CG individuals. In the present study body physique status has been assessed in terms of Waist to hip ratio and Waist to height ratio. According to the recommendations for Asians, the thresholds value of WHR is 0.90 (17) for men. WHR is usually conceived as an index of fat distribution, low WHR indicating a more curvaceous body shape with low abdominal adiposity. In the present study the average value of WHR (fig: 3.a) in EG and CG individuals are 0.85 and 0.92 respectively indicating higher value than cutoff in CG individuals. The WHtR value of EG individuals has been significantly lower (fig: 3.b) compared to their CG counterparts. Hand muscle strength is a significant predictor of health status, increasing muscle strength might have some important role in enhancing physical functioning and hence increasing the level of fitness (15, 16). It has been found from the result of the present study that the mean handgrip strength of both the hands of EG individuals in vertically downwards and horizontal position was significantly higher ($P<0.05$) in EG individuals compared to CG individuals (fig: 4); similar trend has also been found in case of pinch strength and flexibility (fig: 5). The result is similar to the finding of previous study (6).

5 CONCLUSION

On the basis of the present study, it could be concluded that football, if practiced regularly, has beneficial impact on maintaining physical fitness and on attaining favorable body physique.

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