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Study on physical fitness and body composition of national level female football players

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Abstract
The purpose of the study was to observe the Physical fitness and body composition of national level female football players. 22National level 15 to 18 years female football players were selected as subjects of this study. To conduct the study AAHPERD youth physical fitness test battery (i.e. 50 yard dash, sit up, flex arm hang, standing broad jump, shuttle run and 600 yard run/walk)and skin fold method of Jackson & Pollock for body composition were taken as criterion measure. After collecting the data descriptive statistics and correlation analysis were adopting and the following conclusions were drawn –

1. The female National level football players of Purba Medinipur district were found having more lean body mass.
2. % of fat was found less in female National level football players.
3. No significant relation was found between physical fitness and Body Composition.

Keywords: fitness, AAHPERD, body composition, test battery

1. Introduction

Physical Fitness' is the ability to meet the demand of your environment or lifestyle and have some stored energy utilize the leisure time and meet the emergency .

The term 'Physical Fitness' and 'Motor Fitness' are often used inter related however motor fitness is a broader concept which includes both physical fitness and motor ability factors. The president's council on physical fitness and sports (Clarke, 1971) described physical fitness a having three basic components: muscular strength, muscular endurance and circulatory-respiratory endurance. Motor fitness includes there three physical fitness components, plus four additional factors: Muscular power, agility, speed and Flexibility.

Body composition is used to describe the percentage of body fat, bone, water and muscle in human bodies. Because muscle tissue, takes up less space in the body than fat tissue, body composition, as well as weight, determines leanness. The evaluation of body composition permits quantification of the major structural component of the body muscle, bone and fat.

From the studies of a number of researchers, it appeared that in case of normal younger man 18-24years the body fat percent varies between 4.2-18.7 percent. In case of older man (27-50 years), it is about 13-26 percent. On the other hand, for younger women (17-25 years) it is between 17-28 percent and in case of older women (30-35 years) 22-39 percent. However, among athletes the percent of the body fat is relatively lower than the sedentary person. The distributions of bodyfat percent in male and female international athletes are as follows (Me Ardle *et al*. 1991)

Regular exercise has positive effects on children's somatotype classifications and anthropometric characteristics (Berg *et al*., 1995) [1]. Since there is a relationship especially between body height and many physical and physiological characteristics, these display significant effects on exercise and certain games (Docherty, 1996) [2]. The general aim of studies on body height, structure and composition is to determine and develop physical fitness individually (Artioli *et al*., 2008) [3] and suitable anthropometric profile and body composition for physical activity are important (Canhadas *et al*., 2010) [4]. There is a strong relationship between physical activity and body composition (Reicherte *et al*., 2012) [5].

Body shape is closely correlated with health, blood pressure increases with the increases of body mass and waist-to-hip ratio, and it is more obvious in males than in females, the body mass and waist-to-hip ratio (Shahtahmasebi & Cassidy, 2015) [6]. The Relationship between Body Composition and Physical Fitness Parameters in Children, in this study significant relationship has been found with the exception of age, arm and waist measurements ($p<0.05$). In both genders, positive or negative relationships have been found between height, circumference measurements and somatotype characteristics and performance tests ($p<0.05$). It was found that there is a negative or positive relationship between the heights, circumference measurements and somatotype characteristics and their strength, endurance, speed, flexibility and balance characteristics of female and male children. (Nebahat Eler 2018) [7].

2. Purpose of The Study

The purpose of the study were –

1. To measure the selected Physical fitness components of National level female football players.
2. To measure the body composition of National level female football players.
3. To determine relationship between physical fitness and Body Composition of National level female football players.

3. Methodology

To observe the physical fitness and Body composition of National level female football player22 Subjects were selected from Purba Medinipur district Sports Association in West Bengal. The age of the subjects was from 14to18 years. In the present study, Age, Height, and Weight were considered as personal data. For the Physical fitness AAHPERD youth physical fitness test battery and for body composition 4-Site Skin fold Body Fat Calculator (Jackson-Pollock Formula) UPDATED were selected as the measuring criteria.

All the subjects were performed of the test with in stipulated time. The test includes flex arm hang for muscular endurance and strength of arm, bent-knee sit up for abdominal muscular strength,4 X10 meter shuttle run for agility, standing broad jump for explosive strength, 50yard dash for speed and 600yard run for cardio vascular endurance. The subject were encouraged and instructed to perform their best. All the tests were conduct through standard procedure as par test manual and all the raw scores were converted into standard score according to the AAHPERD norms. For measured the Body composition of the subjects 4-Site(i,e Triceps, Suprailiac, Umbilicus and Mid-thigh) Skin fold Body Fat Calculator (Jackson-Pollock Formula) UPDATED technique was used.

4. Result and Discussion

4.1 Analysis of Personal Data

Table 1: The Mean and SD value of personal data of the subjects

Personal data	(Mean & SD)
Age (Yrs.)	16.45±1.14
Height (cm)	156.45± 6.37
Weight (kg)	42.41±3.72

From the table no. 1 we can see that the Mean value and the SD of age were 16.45±1.14 on the other hand Mean value and SD of height were156.45± 6.37 of the Mean value and SD of weight were 42.41±3.72 respectively.

Table 2: The Mean and SD value of physical fitness components and Body Composition of the subjects

Descriptive Statistics		
	Mean	Std. Deviation
Total Physical fitness	374.42	38.68
Flex arm hang in number	94.81	2.25
Sit up in number	85.62	9.11
Shuttle run second	40.68	19.35
SBJ in feet	49.89	15.88
50 yard timing in second	49.09	20.16
600 yard timing in second	54.34	7.94
Body fat %	15.95	1.88
Fat mass in kg	6.46	1.44
Lbm in kg	34.66	4.71

From the table no 2 it was found that the mean and SD value of total physical fitness of National level female football player were 374.42 and 38.68 respectively.

The mean and SD value of Flex arm hang of National level female football player were 94.81 and 2.25 respectively.

The mean and SD value of Bent-knee sit upof National level female football player were 85.62 and 9.11 respectively.

The mean and SD value of Shuttle run of National level female football player were 40.68 and 19.35 respectively.

The mean and SD value of standing broad jump of National level female football player were 49.89 and 15.88 respectively.

The mean and SD value of 50yrd.run of National level female football player were 49.09 and 20.16 respectively.

The mean and SD value of 600yrd.run of National level female football player were 54.34 and 7.94 respectively.

the mean and SD value of Body Fat % of National level female football player were 15.95 and 1.88 respectively.

The mean and SD value of Fat mass of National level female football player were 6.46 and 1.44respectively.

The mean and SD value of Lean body mass of National level female football player were 34.66 and 4.71 respectively.

Table 3: The Pearson Correlations value of physical fitness components and Body Composition of the subjects

Pearson Correlations			
	Body fat %	Fat mass	LBM
Total Physical fitness	0.119	-0.266	-0.298
Flex arm hang	-0.203	-0.037	-0.040
Sit up	-0.098	0.336	0.453*
Shuttle run	0.232	0.048	-0.231
SBJ	-0,124	-0.146	0.018
50 yard run	0.061	-0.406	-0.404
600 yard run	0.275	-0.230	-0.408
*. Correlation is significant at the 0.05 level			

Df=20, ‘r’ value=0.423 at 0.05 level .

From the table no- 3 it was observed that a significant relationship was found between Sit-ups and Lean Body Mass. The level of significant at 0.05 level and the significant value was found to be 0.453 respectively. Whether no other significant relationship were found among Total Physical Fitness, Physical Fitness components and Body Composition variables of National level female football players.

5. Conclusion

Body fat percentages can be classified as very lean, lean, normal, overfat and obese according to the 4-Site Skin fold Body Fat Calculator (Jackson-Pollock Formula) UPDATED. Because female typically have more body fat than male, each gender has distinct percentage ranges. For female, 0.00 to 12.2 percent of body fat is considered as very lean, 12.3 to 19.2 percent body fat is lean, 19.3 to 28.9 percent body fat is normal, 29.0 to 35.9 percent body fat is over fat and 36.0 to above is obese categories.

On the basis of this norm the followings conclusion has been drawn;

1. The National female football players were found having more lean body mass.
2. The fat mass was found less in National female football players.
3. AAHPERD Youth Physical Fitness test was conducted to measure physical fitness and it has been found that the National female payers have above average Physical Fitness.
4. After calculate the Pearson correlations a significant relationship was found between Sit-ups and Lean Body Mass.

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