

A Comparative Study of Body Composition between Male and Female Basketball Players

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ABSTRACT

The present study had been designed to investigate the body composition between male and female Basketball players of Kurukshetra University Kurukshetra. For accomplish the study total 40 basketball players were selected as sample. Out of that 20 were male and 20 female. The age level of the subjects was ranged from 18 to 25 years. All samples were selected from the Kurukshetra University Kurukshetra. The data was analyzed by applying 't' test in the order to determine the difference of body composition between the male and female basketball players, the level of significance was set at 0.05.

Keywords: body fat, lean body mass, BMI, skin fold caliper.

INTRODUCTION

Body composition is a key component of an individual's health and physical fitness profile. Obesity is a serious health problem that reduces life expectancy by increasing one's risk of developing coronary artery disease, hypertension, type 2 diabetes, obstructive pulmonary disease, osteoarthritis, and certain types of cancer. Too little body fat also poses a health risk because the body needs a certain amount of fat for normal physiological functions. Essential lipids, such as phospholipids, are needed for cell membrane formation; nonessential lipids, like triglycerides found in adipose tissue, provide thermal insulation and store metabolic fuel (free fatty acid). In addition, lipids are involved in the transport and storage of fat-soluble vitamins (A, D, E, and K) and in the functioning of the nervous system, as well as in growth and maturation during pubescence. Thus, too little body fatness, as found in individuals with eating disorders (anorexia nervosa), exercise addiction, and certain disease such as cystic fibrosis, can lead to serious physiological dysfunction.

Individual with body fat levels falling as or near the extremes of the body fat continuum are likely to have serious health problems that reduce the life expectancy and threaten their quality of life. Obese individuals have a higher risk of cardiovascular disease.

TYPES OF OBESITY

The way in which fat is distributed in the body may be more important than total body fat for determining one's risk of disease. The waist-to-hip-ratio (WHR) is strongly associated with visceral fat, and the impact of regional fat distribution on health is related to the amount of visceral fat located in the abdominal cavity. Abdominal fat is strongly associated with disease such as CHD, diabetes, hypertension, and hyperlipidemia.

The term **android obesity** and **gynoid obesity** refer to the localization of excess body fat mainly in the upper body (android) or lower body (gynoid). Android obesity (apple shaped) is more typical of males; gynoid obesity (pear shaped) is more characteristics of females. However, some men may have gynoid obesity, and some women have android obesity. Android obesity is frequently simply called upper-body obesity, and gynoid obesity is often described as lower-body obesity.

BODY COMPOSITION

In physical fitness, body composition is used to describe the percentages of fat, bone, water and muscle in human bodies. Because muscular tissue takes up less space in our body than fat tissue, our body composition, as well as our weight, determines leanness. Two people of equal height and body weight may look completely different from each other because they have a different body composition. But in this study we only measure body fat, so we discussed only about body fat. Body composition (particularly body fat percentage) can be measured in several ways. The most common method is by using skin calipers to measure the thickness of subcutaneous fat in multiple places on the body. This includes the abdominal

area, the subscapular region, arms, buttocks and thighs. These measurements are then used to estimate total body fat with a margin of error of approximately four percentage k1 points.



Figure 1 Measurement of biceps



Figure 2 Measurement of triceps



Figure 3 Measurement of subscapular



Figure 4 measurement of suprailiac

The body fat percentage of a human or other living being is the total mass of fat divided by total body mass; body fat includes essential body fat and storage body fat. Essential body fat is necessary to maintain life and reproductive functions. The percentage of essential body fat for women is greater than that for men, due to the demands of childbearing and other hormonal functions. The percentage of essential fat is 3–5% in men, and 8–12% in women (referenced through NASM). Storage body fat consists of fat accumulation in adipose tissue, part of which protects internal organs in the chest and abdomen. The minimum recommended total body fat percentage exceeds the essential fat percentage value reported above. A number of methods are available for determining body fat percentage, such as measurement with calipers or through the use of bioelectrical impedance analysis.

The body fat percentage is a measure of fitness level, since it is the only body measurement which directly calculates a person's relative body composition without regard to height or weight. The widely used body mass index (BMI) provides a measure that allows the comparison of the adiposity of individuals of different heights and weights. While BMI largely increases as adiposity increases, due to differences in body composition, other indicators of body fat give more accurate results; for example, individuals with greater muscle mass or larger bones will have higher BMIs.

KEY WORD DEFINATIONS

1. **BODY FAT**- “The percentage of a person’s body that is not composed of water, muscle, bone, and vital organs”
2. **LEAN BODY MASS**- Lean Body Mass is a component of body composition, calculated by subtracting body fat weight from total body weight: total body weight is lean plus fat. In equations:

$$\text{LBM} = \text{BW} - \text{BF}$$

Lean Body Mass equals Body Weight minus Body Fat

$$\text{LBM} + \text{BF} = \text{BW}$$

Lean Body Mass plus Body Fat equals Body Weight

The percentage of total body mass that is lean is usually not quoted – it would typically be 60–90%. Instead, the body fat percentage, which is the complement, is computed, and is typically 10–40%. The Lean body mass (LBM) has been described as an index superior to total body weight for prescribing proper levels of medications and for assessing metabolic disorders, as body fat is less relevant for metabolism.

3. **BODY MASS INDEX (BMI)**- The BMI for a person is defined as their body mass divided by the square of their height—with the value universally being given in units of kg/m². So if the weight is in kilograms and the height in meters, the result is immediate, if pounds and inches are used, a conversion factor of 703 (kg/m²)/(lb/in²) must be applied.
4. **SKIN FOLD CALIPPER**- n instrument used to measure the breadth of a fold of skin, usually on the posterior aspect of the upper arm or over the lower ribs of the chest.



RESEARCH PROCESS AND METHODOLOGY

For accomplish the purpose of the study 40 basketball male and female players were randomly selected as subject The age levels of subjects were ranged from 18 to 25. Out of all independent variables (sample) 20 were male and 20 players were female. Subjects were selected through probability type of sampling and simple random sampling was used.

TOOL AND TECHNIQUE

For measure the body fat body fat clipper was used. Four point skin fold and lean body mass calculator was used to get fat%, lean body mass and body mass index

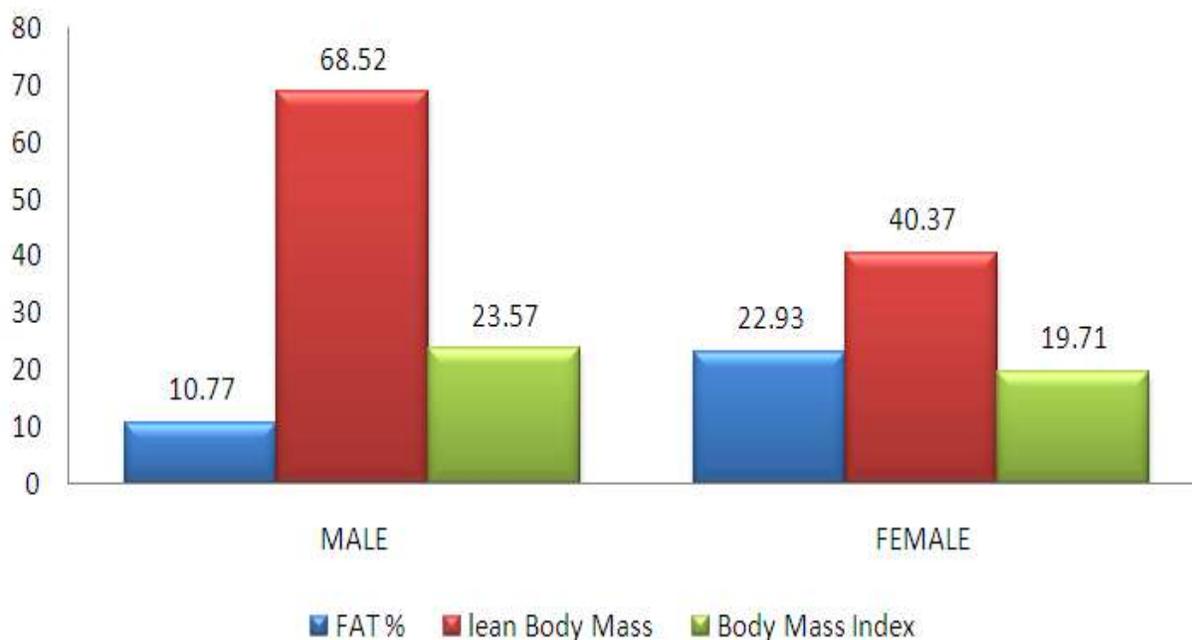
STATISTICAL METHOD

The obtained data were analyzed by applying t test in order to determine the difference of body fat, lean body mass and body mass index between the male and female Basketball players.

Table 1: Mean Difference Between The Male And Female Basketball Players In Their Fat%, Lean Body Mass And Body Mass Index

SR.NO	VARIABLES	GROUPS	N	MEAN	SD	MD	df	t-value
1	FAT %	MALE	20	10.77	4.02			
2	FAT%	FEMALE	20	22.93	2.30	12.15	38	11.70
3	LEAN BODY MASS	MALE	20	68.52	10.66			
4	LEAN BODY MASS	FEMALE	20	40.37	3.59	28.15	38	11.18
5	BODY MASS INDEX	MALE	20	23.57	1.65			
6	BODY MASS INDEX	FEMALE	20	19.71	1.91	3.86	38	6.80

Table 2: Mean Score of Male and Female Basketball Players in Their Fat%, Lean Body Mass and Body Mass Index



RESULTS

FAT RESULTS: table no 1 shows that ‘t’ value (11.70) for the mean score of fat% between the male and female basketball players is higher than the table value 0.05, which is significant. It means there is a significant difference found between male and female basketball players in their body fat%. According to the result of the table female basketball players have more fat% than male basketball players.

LEAN BODY MASS RESULTS: table no 1 shows that ‘t’ value (11.18) for the mean score of lean body mass between male and female basketball players is higher than the table value 0.05, which shows significant difference. It means there is a significant difference found between male and female basketball players in their lean body mass. After studying the result it should be said that basketball males have lean body than the female basketball players. Female have much body fat and low lean body mass in comparison to male basketball players.

BODY MASS INDEX RESULTS: table no 1 show that 't' value (6.80) for the mean score of body mass index between the male and female basketball players is higher than the table value 0.05, which shows that there is a great difference between the male and female basketball players in their body mass index. Table result shows that male basketball players have more body mass index than the female basketball players but they not comes in the obesity.

DISCUSSION

Body composition plays a great role in all games. In this study we analysis the component of body composition such body fat, lean body mass and body mass index. All these components affect the individuals via different ways. A certain amount of fat is essential for the better functioning of human body but access amount of fat is a bad sign of health. Access fat is the causes of more serious health related disease like, diabetes, hypertension, pulmonary disease and a certain type of cancer. In this study we find that female basketball player have access amount of fat than the male basketball players. Females have more fat% than male due to this they have low amount of lean body mass, which is the cause that female have lace of power, because muscles are directly responsible for the strength.

A look at the Olympics medals tally tells it all. Indians are not known for their attempt to sprint or complete a marathon in record time. Yet as Sunday's marathon hour draws closer, social networks are abuzz with possibilities. The Barefoot Runners have put up a jingoistic line: "**Can Indians compete in marathons world-wide?** Results show Indians beat even Kenyans in Half Marathons (not, in a FM)." The entry goes on to compare timings clocked at various half marathons across the world and shows that "even our 5th is better placed than 1st elsewhere".

Medically speaking, Indians seem to be at a disadvantage as far as competitive running is concerned. Blame it on our thrifty gene that helps in storing fat; doctors say the thrifty gene is an inheritance from times when famines were common in pre-British India. Sports medicine specialists blame the poor proportion of right muscles.

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