



DIFFERENCE IN BODY COMPOSITION BETWEEN PITCHERS AND POSITION PLAYERS IN DIVISION-1 BASEBALL

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Abstract

Introduction: Body composition measurements are becoming more relevant in the field of sports. Body fat percentage is a major value observed when these measurements of fitness are made. There are many different methods of recording this value, the most available and accurate being the underwater weighing method. Other values for body composition include the body mass index and waist to hip ratio of an individual. Baseball players need to be in peak conditioning during the season. Coaches are beginning to use these numbers as a prerequisite for the opportunity to play. Research has shown that the measurements that fall within certain categories are indicative of optimum athletic performance. The purpose of this study was to compare body composition between pitchers and position players in Division-1 baseball players. Methods: Eight male baseball players (age 21.5 ±0.5 yrs.) at the University of Texas at Arlington volunteered for this study. Four of the athletes were pitchers (P) and four were position players (PP). Subjects were verbally asked for age, height, and weight measurements. The height and weight values were used to calculate BMI. The waist (smallest circumference around waist) and hip measurements (largest circumference around buttocks) were taken using a Gulick tape in cm and used to calculate the WHR ratio. Skinfolds were taken at seven sites which included the subscapular, chest, tricep, midaxillary, abdomen, suprailiac, and thigh. Each site was measured twice. Using the mean of each value, body fat percentage was calculated and recorded. The final step was the measurement of body fat percentage using the underwater weighing tank located in the Kinesiology lab. The subjects were suspended on a swing, submerged completely under water and told to exhale all the air from the lungs. The procedure was done 3-5 times to ensure consistent values. Results: The body mass indexes were (P: 25.5 ±1.38; PP: 25.925 ±1.61) resulting in no significant difference (p=0.62). Waist to hip ratios were also not significantly different (P: .844 ±.02; PP: .863 ±.01; p = 0.14). The body fat percentages, using the seven site skinfold test were (P: 13.45 ±1.75%; PP: 13.95 ±1.53%) and the underwater weighing method (P: 14.19 ±1.64%; PP: 14.79 ±1.53%) were also not significantly different (p=0.74 and p=0.67, respectively). Conclusion: The results of this study indicated that there was no significant difference between all body composition measurements taken between position players and pitchers at the University of Texas at Arlington.

Purpose

The purpose of this study was to compare and find the difference in body composition between pitchers and position players in Division-1 baseball players.

Methods

The sample group consisted of eight male baseball players (age 21.5 ±0.5 yrs.) at the University of Texas at Arlington. Four of the athletes were pitchers (P) and four were position players (PP). Upon arrival the subject was asked for their height, weight, and age. Using the Body Mass Index (BMI) equation, BMI was calculated and recorded. BMI is a ratio of the weight and height of a subject. Using a tape measure (cm) the subjects' waist was measured at its smallest point and their hips were measured at the thickest point around the gluteus maximus. A ratio was calculated and recorded from these values. To perform a skinfold, a fold of skin was pinched between the thumb and forefinger, about 1 cm above the landmark. Then the jaws of the skinfold calipers were applied to the fold and the spring handles released fully. When the pointer on the dial was steadied, the measurement in millimeters was observed and recorded. The measurements were all taken on the right side and were repeated a second time.

Methods (cont'd)

The skinfold sites are as follows: **Triceps:** Vertical fold; on the posterior midline of the upper arm, halfway between the acromion and olecranon processes, with the arm held freely at the side. **Subscapular:** Diagonal fold (45°), 1 to 2 cm below the inferior angle of the scapula. **Chest/Pectoral:** Diagonal fold; one half the distance between the anterior axillary line and the nipple (men). **Midaxillary:** Vertical fold; on the midaxillary line at the level of the xiphoid process of the sternum. **Suprailiac:** Diagonal fold; in line with the natural angle of the iliac crest taken in the anterior axillary line immediately superior to the iliac crest. **Abdominal:** Vertical fold; 2 cm to the right of the umbilicus. **Thigh:** Vertical fold; on the anterior midline of the thigh, midway between the proximal border of the patella and the inguinal fold. Hydrostatic or Underwater weighing was taken last. The hydrostatic underwater weighing procedure involves being completely submerged in a tank or tub for 3-5 seconds while the subject's underwater weight is measured. This procedure was repeated 3-5 times to find a consistently low weight. The subjects were asked to sit on the swing that was suspended in the water, take several deep breaths, then exhale as much as possible while they completely submerged themselves by bending forward beneath the water. Continuing to exhale as much air as possible and holding very still a reading is taken. A tap on the chain alerted the subject that the reading was recorded. The subjects were told that if uncomfortable at anytime, they could raise above the water or quit the testing all together with no penalty. The pool was less than 4 feet deep and the subjects could stand up at any time. Percent body fat was found using the Siri equation. t-tests were used to find significant difference between the two groups pertaining to each set of measurements.

Results

The body mass indexes (P: 25.5 ±1.38; PP: 25.925 ±1.61) showed no significant difference (p=0.62). Waist and hip ratio values also resulted in (P: .844 ±.02; PP: .863 ±.01) no significant difference (p=0.14). The body fat percentages using the seven site skinfold test (P: 13.45 ±1.75%; PP: 13.95 ±1.53%) showed no significant difference (p=0.74). The body fat percentages using the underwater weighing method (P: 14.19 ±1.64%; PP: 14.79 ±1.53%) were also not significantly different (p=0.67).

Results (cont'd)

Table 1: Means Of All Measurements Taken (Body Mass Index, Waist/Hip Ratio, % Body Fat Using Skinfold Measurements, and % Body Fat Using Underwater Weighing Measurements

	BMI	Waist Hip	BF% SF	BF% UWW
Pitchers	25.5	0.8435	13.45	14.19
Pos. Players	25.925	0.8625	13.95	14.79

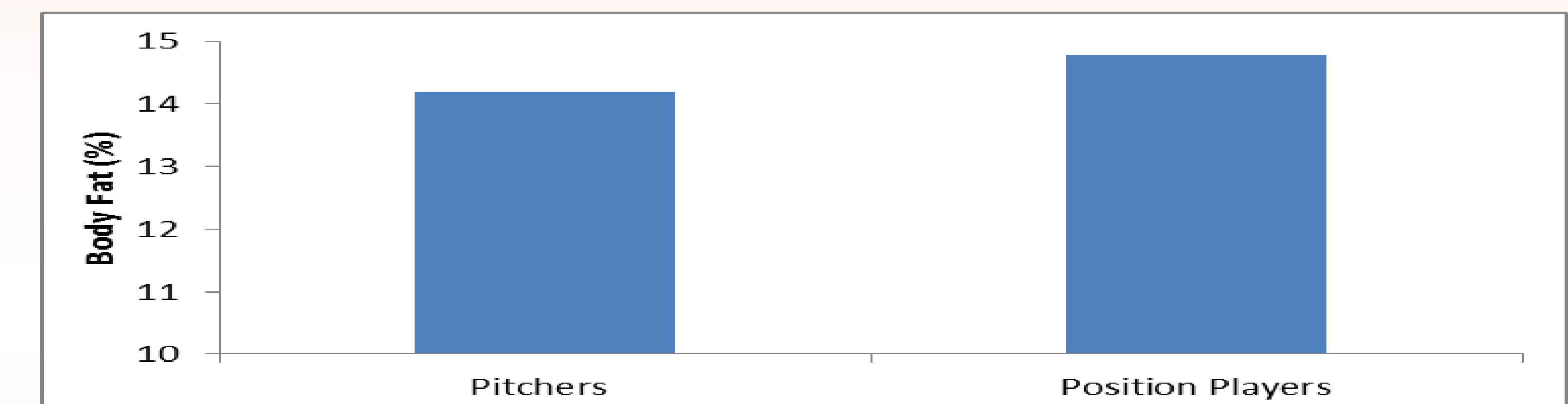


Figure 1: Difference In Percent Body Fat Between Pitchers and Postions Players Using Underwater Weighing

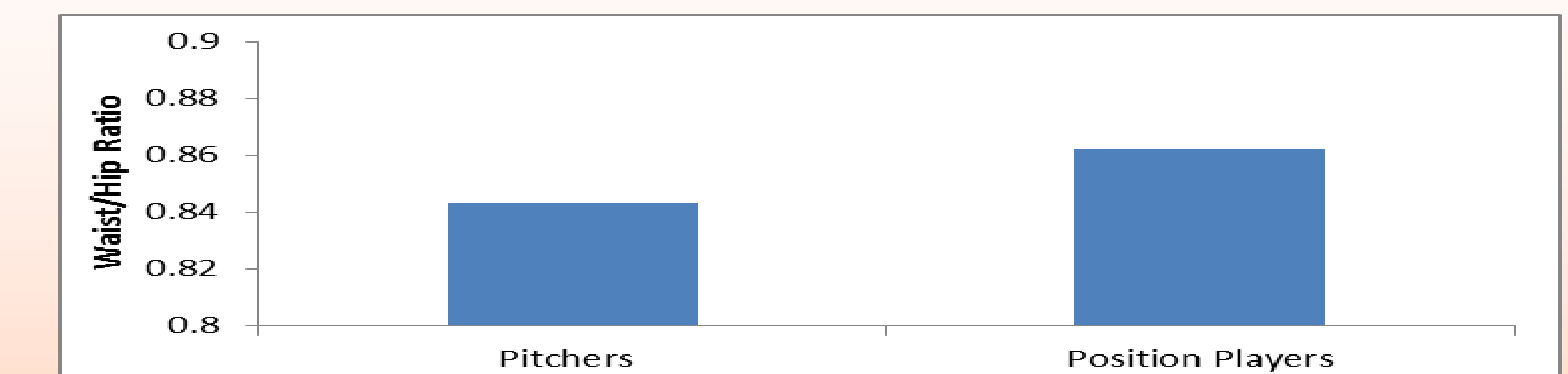


Figure 2: Difference In Waist to Hip Ratio Between Pitchers and Postion Players

Conclusions

There was no significant difference found in any body composition measurements taken in this research study. The two groups of athletes, in season, have different training programs but tend to exert themselves similarly while the season is in progress. A bigger sample size is suggested for further study.