



## **Analysis of Little League Baseball Athletes' Energy Expenditure on Outfield and Infield Position Throwing Skills**

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### **Abstract**

This study aims to analyze the energy requirements of the throwing technique of Little League Baseball Athletes. The method used is a survey method with a cross-sectional study design. The research population is the Bandung City Little League Baseball athletes as many as 30 people with a total sampling technique. Energy expenditure of throwing technique was measured using Polar GPS Watch and Heart Rate Monitor. The results showed that the calories expended by male athletes were lower than the calories expended by female athletes in throwing skills. The conclusion of this study is that there are differences in energy expenditure in outfield and infield throwing skills. The implications of this research can be used as input for athletes, coaches, and parents in determining and carrying out training programs so that athletes can achieve optimal performance and achievement.

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## INTRODUCTION

Achieving achievements requires a process that is not easy. One of the processes that must be done in practice. This exercise is absolutely carried out regularly, systematically, and programmed. Athletes' performance components to improve skills and performance in competition must be prepared by the athletes themselves through the training process to improve the body's physiological functions in an effort to improve competitive performance (Smith, 2003). Skill acquisition can also be integrated into the athlete's regular training program to make a significant contribution to competitive performance (Mujika, et al, 2018).

Athletic performance is one of the most complex human phenotypic traits that is influenced by anthropometric, psychological, and physiological traits of training, nutrition, and individual athlete's health status (Massidda et al., 2013). To date, most sports genomics studies have focused on genotypes that predominate in sprint/strength or endurance athletes, representing the physiological extremes of the sport continuum. However, the genetic contribution to success in sports requiring a mix of anaerobic and aerobic qualities has received limited attention (Jenner, et al, 2019). Moreover, perhaps due to the insufficient sample size associated with the low number of elite athletes available for analysis, most studies on team sports genetics have been conducted on teams as a whole, yielding contrasting results (Bourdon, et al, 2017).

Scientific evidence proves that specific physical performance tests and body characteristics with high achievement in the actual performance of pitching and

batting. Young players, their parents, coaches, and coaches will benefit from addressing these characteristics when planning a training program to improve the baseball performance of young players. (Nakata, et al, 2013). Unfortunately, high-calorie snacks and sugar-sweetened beverages dominate the YB neighborhood. Despite the benefits of participating in sports, families of children participating in sports leagues may be at increased risk of poor nutritional habits due to increased exposure to unhealthy foods and eating disorders. (Irby, et al., 2014). This study aimed to determine the energy expenditure of little league baseball athletes on throwing skills.

## METHOD

This study describes a population of minor league baseball athletes aged 7-10 years ( $8.73 \pm 1.12$ ) in West Java. A total of 26 athletes were willing to participate in this study (19 Male; Age  $8.58 \pm 1.17$ ); (and 7 Females; Age  $8.58 \pm 1.17$ ). Polar GPSD heart rate monitor was used to measure the energy expenditure aspect of athletes in throwing skills. Throwing skills test using the O'doneil test. The data is processed using the percentage technique.

## RESULTS AND DISCUSSION

The average energy expenditure of men is  $> 475$  calories while women expend energy on average  $> 445$ . Thus, the average energy expenditure on throwing skills in male athletes is higher than female athletes. Energy expenditure for men and women in Calor units is shown in Figure 1. In men, the average heart rate  $> 137$  per minute, in women the average heart rate  $> 139$  per minute. So, it can be seen that the average heart rate of men is lower than the average

heart rate of women in throwing skills. The average heart rate of little league baseball athletes on throwing skills is shown in Figure 2.

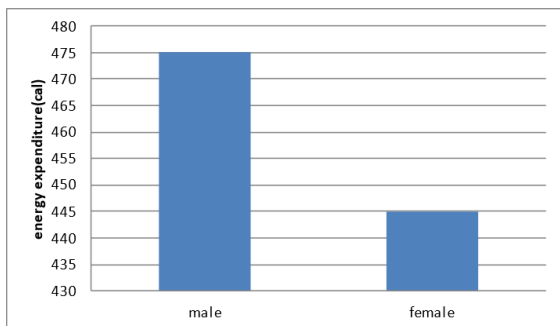


Figure 1. Average Energy Expenditure for Men and Women

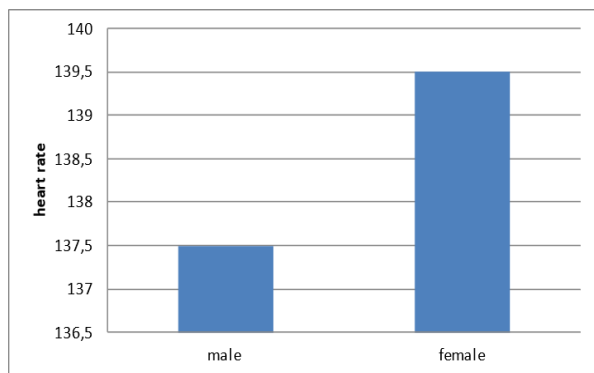


Figure 2. Average Heart Rates for Boys and Girls

The majority of athletes' heart rates in throwing skills are between 130 and 150 per minute. The average age of the athletes in this study was 8 years. Thus, the maximum pulse rate for athletes aged 8 years is 218 per minute. 140 heart rate per minute entered at 70% Exercise intensity. So, from the picture we can see that the average heart rate of athletes in throwing skills is in the medium category. The distribution of the average heart rate data for male and female athletes as a whole is shown in Figure 3.

In the infield position the average energy expenditure is 496.43 calories, out-

field is 443.38, pitcher is 513.33, and cather is 412.4. The highest energy expenditure is in the pitcher position, while the lowest is in the cather position. The average energy expenditure at various positions is shown in Figure 4.

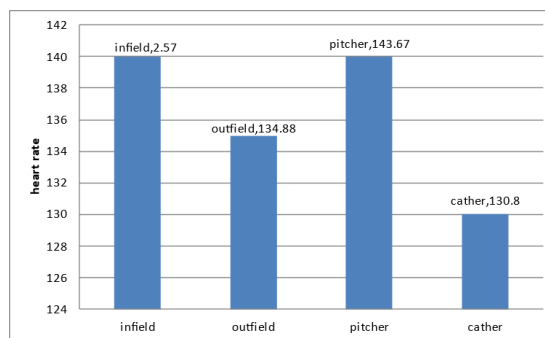


Figure 3. Distribution of Heart Rate in Men and Women

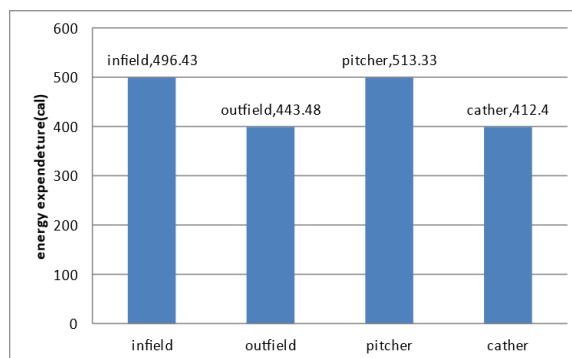


Figure 4. Distribution of Average Heart Rate in Various Positions

## CONCLUSION

Energy expenditure on throwing skills in little league athletes as a whole in male athletes is greater than female athletes. However, the heart rate in men is lower than in women. The aspect of metabolism in different sexes is a factor that determines the amount of calories expended.

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