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The Effect of Weight and Height on the Horizontal Jump of Young Football Players

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Abstract

The purpose of this study was to determine the effect of body weight and height on the horizontal jump of young soccer players. This research is a quantitative research. The design used in this study uses the experimental method. The number of samples in this study were 34 young soccer players in West Sleman, namely SSB AMS Seyegan and SSB Seyegan United. Based on the research data above, the result was that the weight variable was 0.003 <0.05 while the height variable was 0.001 <0.05. Thus it can be concluded that the variables of weight and height affect the horizontal jump. It is understood that body weight and height have a significant influence on the results of the horizontal jump because the more ideal the Body Mass Index of an athlete will affect the results of the athlete's horizontal jump.

Keywords: *Body Weight; Height; Horizontal Jump; Football*

Introduction

Weight gain during participation in soccer is often associated with health risks (Churchill et al., 2018). Research conducted by (Sermaxhaj et al., 2022) revealed that soccer players were significantly influenced by motor skills (speed, agility, and endurance) but not by morphological characteristics (weight and height). According to research conducted by (Joksimović et al., 2019) revealed that morphological characteristics have a very vital role in determining the success of athletes. Biological maturity status has a significant effect on the functional capacity of youth soccer players aged 13-15 years. Training is a significant contributor to aerobic resistance, whereas weight and height are significant contributors to sprint and vertical jump respectively (Malina et al., 2004). This is in line with the statement that vertical jumps can be used to assess neuromuscular status in sports performance (Coswig et al., 2019). The morphological characteristics of athletes determine their success in certain sports in different ways. Knowledge of these characteristics is necessary to determine their significance for success in competitive sports (Goranovic et al., 2021). Football is the most popular sport characterized by high and low intensity movements with repeated physical contact. Anthropometric characteristics, coordination of motor skills, and functional movement abilities are part of the important determinants of success in soccer games (Mong et al., 2022). Muscle strength, power, balance and speed play a decisive role in

football performance (Bogalho et al., 2022). According to research conducted by Revealed that power and vertical jumps can be the determining factors for playing as a starter (Iguchi et al., 2021). According to research conducted by (Yingling et al., 2018) revealed that the vertical jump is used to estimate sports performance abilities and physical fitness in children, the elderly, and individuals. Youth football coaching is indeed the key to success in producing reliable football players in the future. The coaching process must also be carried out seriously, according to the coaching program and the correct football coaching science with the role of parents towards children in the family as motivators, facilitators and mediators (Nugroho & Gula, 2022). Soccer is a high-intensity game that requires a lot of physical skill throughout the game. It takes training that can support the nature of the game of football which requires agility, speed, explosiveness and coordination. Exercises with high intensity and loads have the potential to cause injury (Komarudin, 2021). Optimal physical condition will give an athlete to achieve good performance. One component of the physical condition is explosive power. An increase in this component will be achieved through regular and continuous training, especially with high-intensity training (Fathinita et al., 2015). According to research conducted by (Henggaryadi, n.d.) revealed that physical changes occur when an individual reaches adolescence, where a teenager will experience a period of change or a transitional period from children to adults. At this time many changes occur due to hormonal influences. The physical changes that occur naturally affect physical appearance, such as weight gain, height, and so on.

Method

The design used in this study uses the experimental method. The number of samples in this study were 34 young soccer players in West Sleman, namely SSB AMS Seyegan and SSB Seyegan United. The instruments used to measure body weight are digital scales, while height is measured using a meter. To determine the leg muscle explosive power of young players using a horizontal jump.

Results and Discussion

Data on the results of measurements of young football players are as follows:

Table 1. Research Data

No	Weight (X1)	Height (X2)	Horizontal Jump (Y)
1.	58.0	175.0	258.0
2.	59.0	178.0	260.0
3.	48.0	158.0	220.0
4.	51.0	167.0	231.0
5.	54.0	168.0	243.0
6.	51.0	165.0	240.0
7.	50.0	165.0	241.0
8.	48.0	164.0	239.0
9.	59.0	177.0	259.0
10.	54.0	165.0	244.0
11.	60.0	177.0	262.0
12.	52.0	164.0	238.0
13.	47.0	162.0	226.0
14.	57.0	174.0	257.0
15.	64.0	178.0	263.0
16.	52.0	167.0	233.0

17.	56.0	173.0	251.0
18.	55.0	176.0	252.0
19.	57.0	177.0	257.0
20.	47.0	167.0	241.0
21.	49.0	165.0	227.0
22.	48.0	163.0	223.0
23.	53.0	168.0	241.0
24.	48.0	164.0	231.0
25.	50.0	167.0	243.0
26.	53.0	163.0	234.0
27.	50.0	166.0	248.0
28.	46.0	158.0	224.0
29.	51.0	163.0	238.0
30.	51.0	166.0	241.0
31.	60.0	178.0	265.0
32.	50.0	161.0	237.0
33.	63.0	174.0	266.0
34.	58.0	172.0	259.0

Table 2. Normality Test

p	**Significance**	**Information**
0,979	0,05	Normal

The data obtained in the normality test. Normality test using the Kolmogorov Smirnov method. The results of the data normality test were carried out using the SPSS version 20.0 software program for windows with a significance level of 5% or 0.05. Based on the statistical analysis of the normality test that was carried out using the Kolmogorov Smirnov test, a significance of 0.979 > 0.05 was obtained. This means the data is normally distributed.

Table 3. Homogeneity Test

F	**Significance**	**Information**
1,074	0,05	Homogen

After the data is tested for normality, then the homogeneity test is carried out, the homogeneity test is carried out to test the similarities of several samples, namely homogeneous or not. The homogeneity test is intended to test the similarity of the variants. The homogeneity test in this study is the Levene Test. Based on the statistical analysis of the homogeneity test that has been carried out using the Levene Test. At obtained a significance of 1.074> 0.05. This means that the data group has a homogeneous variant. Thus the population has the same variance or is homogeneous. Homogeneous data records if the sig. >0.05.

Table 4. Effect of Body Weight (X1) and Height (X2) on Horizontal Jump (Y)

Variabel	***p***	**Significance**	**Information**
Weight (X1)	0,003	0,05	Influential
Height (X2)	0,001	0,05	Influential

Based on the research data above, the result was that the weight variable was 0.003 <0.05 while the height variable was 0.001 <0.05. Thus it can be concluded that the variables of weight and height affect the horizontal jump. It is understood that body weight and height have a significant influence on the results of the horizontal jump because the more ideal the Body Mass Index of an athlete will affect the results of the athlete's horizontal jump. The results of this study are in line with the opinion which reveals that in playing soccer, with an ideal body weight athletes can perform soccer movements as a whole well (Gumantan & Mahfud, 2020). While other studies reveal that football is a game in which anthropometric characteristics are an important factor for the position of certain players, where morphological characteristics differ in relation to competitive levels and positions in the game. Body composition is an important indicator of the physical fitness and general health of athletes, the differences in the anthropometric characteristics of professional football players in relation to the position of the players and to determine their importance in the game. The results showed that a statistically significant difference in height and weight was noted between the goalkeeper and midfielder ($p < 0.01$) and the goalkeeper and striker ($p < 0.05$) in favor of the goalkeeper, while there was no difference statistically significant was recorded in body mass index. The lowest height, weight and BMI was recorded in a quarterback. Based on the results of the study it can be concluded that morphological characteristics have a very vital role in determining the success of athletes (Joksimović et al., 2019). According to previous research, it was revealed that the importance of muscle strength in a soccer match, the method for increasing this physical capacity is through horizontal jumps (Flavio et al., 2018). Meanwhile, according to research conducted by (Taskin & Taskin, 2021) revealed that agility and acceleration are known as high-speed actions that have an impact on football performance. Soccer players need VO2Max and horizontal jump to perform high-speed action during soccer matches. Body Mass Index (BMI) is a value taken from a calculation between a person's weight (BB) and height (TB). BMI can be an indicator or describe adipocyte levels in a person's body (Wibowo & Hakim, 2019). This is in line with research conducted by (Haeril et al., 2022) which revealed that BMI (Body Mass Index) is a method for knowing and assessing nutritional status by taking a person's weight and height values. Ideal body weight and height conditions can affect performance in a match, this statement is in accordance with the opinion that in playing football, with ideal body weight athletes can make movements in football well as a whole (Gumantan & Mahfud, 2020). This research can be used as a reference for coaches that with ideal body weight and height can affect an athlete's horizontal jump. Football athletes who have good horizontal jump results will affect the physical condition of an athlete. Meanwhile, according to research conducted by (Komarudin et al., 2023) that physical activity, in addition to improving physical health, can also improve cognitive, social, emotional, and academic performance. A soccer player who has an ideal Body Mass Index (BMI) will easily dribble the ball, this will affect the agility of a soccer player. This statement is in accordance with the opinion (Pamungkas & Sabillah, 2023) that when a player has high agility, the basic skills of playing soccer for the player can be said to be better.

Conclusion

This research is proof that weight and height affect the horizontal jump of young soccer players. The results of this study prove that when a soccer athlete has an ideal BMI (Body Mass Index), it can affect performance in a match. The physical condition of an athlete is a major factor in winning a match

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