COMPETITOR:
JURNAL PENDIDIKAN KEPELATIHAN OLAHRAGA
e-ISSN: 2657-0734 & p-ISSN: 2085-5389 || Volume 17, Number 3, 2025 || P.2376-2380

Relationship Between Height and Smash Accuracy in Volleyball for Students at SMK Negeri 1 Bancak

Arfi Ilham Maulana[1A-E*], Tommy Soenyoto[2B-D]

[1,2] Universitas Negeri Semarang, Semarang, Indonesia
rakailham224@students.unnes.ac.id[1*], tommysoenyoto@mail.unnes.ac.id[2]

ABSTRACT

This study investigates the relationship between height and volleyball smash accuracy among 11th-grade students at SMK Negeri 1 Bancak. Using a quantitative correlational design, data were collected from 30 students selected through purposive sampling. Height was measured using a stature meter, while smash accuracy was assessed through a targeted zone test on a volleyball court, with each participant performing ten attempts. Data were analyzed using Pearson's product-moment correlation after confirming normal distribution via the Shapiro-Wilk test. The results revealed a moderate, positive, and statistically significant correlation between height and smash accuracy ($r = 0.532$, $p = 0.003$). These findings indicate that taller players tend to achieve higher smash accuracy, likely due to advantages in reach and attack angle, which facilitate steeper and more difficult-to-defend shots. Nonetheless, height is not the sole determinant of performance; technique, strength, coordination, and experience also play vital roles. This study provides empirical evidence relevant to school-level volleyball coaching, suggesting that training programs should optimize both anthropometric advantages and technical skills to enhance overall performance.

ARTICLE HISTORY
Received: 2025/08/20
Accepted: 2025/08/27
Published: 2025/10/08

KEYWORDS
Keight;
Accuracy;
Smash;
Volleyball.

AUTHORS' CONTRIBUTION
A. Conception and design of the study;
B. Acquisition of data;
C. Analysis and interpretation of data;
D. Manuscript preparation;
E. Obtaining funding

Cites this Article : Maulana, Arfi Ilham; Soenyoto, Tommy. (2025). Relationship Between Height and Smash Accuracy in Volleyball for Students at SMK Negeri 1 Bancak. **Competitor: Jurnal Pendidikan Kepelatihan Olahraga**. 17 (3), p.2376-2380

INTRODUCTION

Sports play a crucial role in human life, serving as a medium to maintain physical health, provide recreation, and foster character development (Adhi & Magetan, 2025). In the educational context, sports are integrated into the Physical Education, Sports, and Health (PJOK) curriculum, which aims to instil sportsmanship, develop teamwork, improve physical fitness, and promote a healthy lifestyle. Among the various sports taught, volleyball holds a special position because it can be played in school settings with relatively simple facilities, while simultaneously training both physical and social skills (Nurfalah et al., 2019).

Volleyball is played by two teams of six players, with the primary objective of hitting the ball over the net so that it lands within the opponent's court. Several basic techniques are essential in this game, including serving, passing, blocking, and smashing. Among

Arfi Ilham Maulana[1A-E*], Tommy Soenyoto[2B-D]
rakailham224@students.unnes.ac.id[1*]

these, the smash—or spike—is considered the main offensive weapon to score points, performed by jumping and striking the ball downwards at high speed (Maifa, 2021; Prabawa et al., 2021). An effective smash requires not only power and agility but also coordination, balance, and accuracy (Maulana et al., 2025).

One anthropometric factor often associated with smash performance is height. Taller players typically have a greater reach during jumps, enabling sharper attack angles and making smashes harder to defend (Ikbar et al., 2017; Ramawan et al., 2020). This has led to the perception that height is an advantage when selecting core players (Andriansyah, 2021). However, previous studies indicate that height alone does not guarantee smash success. Players with average or shorter stature can sometimes outperform taller athletes in smash accuracy due to superior technique, timing, and tactical awareness (Dimi et al., 2023; Shalahudin & Sifaq, 2023).

This phenomenon is also evident at SMK Negeri 1 Bancak, where volleyball is a popular sport among Grade XI students. Preliminary observations suggest that students with above-average height do not always achieve higher smash accuracy, whereas some average-height players can execute more precise smashes into targeted zones. Considering that students aged 16–17 are still in the process of physical development and may not have reached their final height, investigating the relationship between height and smash accuracy is important. Such research can help PJOK teachers and coaches design training programs tailored to each student's physical characteristics (Prabawa et al., 2021).

From a theoretical standpoint, smash accuracy is influenced not only by height but also by factors such as jump timing, hitting angle, eye–hand coordination, and the ability to anticipate the opponent's movements (Maifa, 2021). Understanding the relative contribution of height compared to these other factors is essential to provide clear empirical evidence. Moreover, there is still limited research specifically focusing on vocational high school students in Semarang Regency, as most studies target professional athletes or students in urban areas. Therefore, this study aims to determine whether there is a significant relationship between height and volleyball smash accuracy among Grade XI students of SMK Negeri 1 Bancak. The findings are expected to contribute both theoretically, by expanding knowledge of the influence of anthropometric characteristics on volleyball performance, and practically, by guiding training strategies for school-based volleyball development.

METHODS

This study employed a quantitative approach with a correlational research design aimed at determining the relationship between height (independent variable/X) and volleyball smash accuracy (dependent variable/Y) among 11th-grade students at SMK Negeri 1 Bancak. The research was conducted at SMK Negeri 1 Bancak, Semarang Regency, from July to August 2025 during Physical Education classes. The study population consisted of 30 11th-grade students enrolled in Physical Education, with the

Arfi Ilham Maulana[1A-E*], Tommy Soenyoto[2B-D]
rakailham224@students.unnes.ac.id[1*]

sample selected using purposive sampling, namely, students who were willing to participate in the research. Data collection was carried out through height measurements using a stature meter and smash accuracy tests with target zones on a volleyball court, in which each student performed 10 smash attempts. The research instruments included a stature meter, standard volleyballs, a volleyball court with designated target zones, and a scoring sheet. Data were analyzed using the Pearson Product-Moment correlation test at a significance level of 0.05, following a normality test using the Shapiro-Wilk method.

RESULTS AND DISCUSSION

Result

Normality testing was conducted to determine whether the research data were normally distributed. The Shapiro–Wilk test was used because the sample size was less than 50, with a significance level (α) of 0.05. The results of the normality test are presented in Table 1.

Table 1.
Normality Test Results

	Shapiro–Wilk		
	Statistic	**df**	**Sig.**
Smash Accuracy Score	.980	30	.821
Height	.954	30	.214

Based on Table 1, the significance value for the Smash Accuracy Score variable was 0.821, and for the Height variable was 0.214. Both values are greater than 0.05, indicating that the data for both variables were normally distributed. Since the normality assumption was met, parametric statistical analysis, such as the Pearson correlation test, could be used to examine the relationship between height and volleyball smash accuracy among the 11th-grade students at SMK Negeri 1 Bancak.

Table 2.
Correlation Test Results

Correlations	**Height**	**Smash Accuracy Score**
Height	Pearson Correlation	1
	Sig. (2-tailed)	
	N	30
Smash Accuracy Score	Pearson Correlation	.532
	Sig. (2-tailed)	.003
	N	30

Based on Table 2, the correlation coefficient (r) between height and smash accuracy score was 0.532, with a significance value of 0.003 ($p < 0.01$). This indicates a moderate, positive, and statistically significant relationship between height and volleyball smash accuracy. In other words, the taller the students, the better their smash accuracy scores tended to be. Therefore, the hypothesis stating that there is a relationship between height and volleyball smash accuracy among the 11th-grade students at SMK Negeri 1 Bancak was accepted.

Arfi Ilham Maulana[1A-E*], Tommy Soenyoto[2B-D]
rakailham224@students.unnes.ac.id[1*]

These findings align with the theory that height is one of the anthropometric factors influencing smash performance in volleyball. Taller stature allows players to reach the ball at the highest possible point during a jump, enabling a more optimal smash angle and trajectory. As a result, the probability of the ball passing the opponent's block and landing in their court increases.

This result supports the study conducted by Rohman (2019), which reported a positive relationship between height and smash ability among volleyball athletes at SMA Negeri 2 Klaten, where taller players could produce sharper and more accurate smashes. Similarly, Setiawan & Nugroho (2021) found comparable results in volleyball club athletes, showing that height significantly contributes to offensive effectiveness, particularly in smashing, due to its effect on arm reach and hitting angle.

From a biomechanical perspective, taller stature provides advantages during the take-off and contact point phases. Players with above-average height have greater vertical reach, allowing contact with the ball at a higher point. This advantage makes it easier to execute steeper attack angles, making the ball more difficult for opponents to anticipate (Bompa & Buzzichelli, 2019).

However, despite the significant relationship, height is not the sole determinant of smash accuracy. Pratama's (2020) research showed that players with shorter stature could still achieve high smash accuracy if they possess good technique, strong leg muscles for jumping, excellent hand–eye coordination, and precise timing. Therefore, technical skills and physical conditioning remain essential factors to be developed alongside anthropometric aspects.

CONCLUSION

Based on the results of the study, it can be concluded that there is a significant positive relationship between height and volleyball smash accuracy among 11th-grade students at SMK Negeri 1 Bancak. The Pearson correlation analysis, r value of 0.532 with a significance level (Sig. 2-tailed) of 0.003, indicating $p < 0.05$. This suggests that the taller a student's stature, the better their smash accuracy tends to be. These findings align with the theory that height provides an advantage in reach and attack angle in volleyball, thereby facilitating more effective smash execution. Therefore, height can be considered one of the supporting factors in improving smash performance, although other factors such as technique, strength, coordination, and playing experience also play an important role. For students: It is important to develop smash technique skills through regular, structured training that follows the principles of exercise, to maintain optimal performance even for players with shorter stature. For future researchers: It is recommended to expand the research variables, use a larger sample size, and compare results across different age groups or competition levels to produce more comprehensive findings and stronger generalizability.

Arfi Ilham Maulana[1A-E*], Tommy Soenyoto[2B-D]
rakailham224@students.unnes.ac.id[1*]

ACKNOWLEDGMENT

The researcher would like to express sincere gratitude to the principal, teachers, and staff of SMK Negeri 1 Bancak for their valuable support and cooperation throughout the research process. Special appreciation is extended to the Physical Education teacher for granting permission and providing assistance during the data collection. The researcher is also grateful to the students who participated in the study with enthusiasm and dedication. Their contributions were essential to the successful completion of this research.

REFERENCES

Adhi, B. P., & Magetan, D. N. (2025). Hubungan antara Kekuatan Otot Lengan terhadap Kemampuan Smash Permainan Bola Voli Pada Siswa SMK Maospati. PTK: Jurnal Tindakan Kelas, 6(1), 1–11.

Andriansyah. (2021). Konstribusi Tinggi Badan Terhadap Akurasi Smash Tim Bola Voli. Journal Olahraga Indragiri, 8(1), 241–251.

Dimi, S., Sutoro, S., Putra, M. F. P., Wandik, Y., Womsiwor, D., & Sinaga, E. (2023). Tinggi badan, kekuatan otot lengan, dan keterampilan servis atas bola voli: sebuah tinjaun singkat. Multilateral : Jurnal Pendidikan Jasmani Dan Olahraga, 22(4), 256. https://doi.org/10.20527/multilateral.v22i4.16475

Ikbar, R., Studi Pendidikan Jasmani, P., & dan Rekreasi, K. (2017). Kontribusi Tinggi Badan Dan Tinggi Lompatan Terhadap Smash Bola Voli Pemain Bola Voli Klub Lavendos Vc Kecamatan Jaya Kabupaten Aceh Jaya Tahun 2016. Pendidikan Jasmani, Kesehatan Dan Rekreasi, 3(3), 242–247. https://jim.usk.ac.id/penjaskesrek/article/view/6739

Maifa, S. (2021). Analisis Komponen Fisik terhadap Kemampuan Smash Bola Voli. Jurnal Pendidikan Kesehatan & Rekreasi, 4(1), 62–68.

Maulana, A., Basri, M. H., Suparto, A., & Jasmani, P. P. (2025). Hubungan Kekuatan Otot Lengan dan Berat Badan Terhadap Ketepatan Smash dalam Bola Voli di PBV . Pelopor Muda mempengaruhi hasil pertandingan . Smash yang efektif tidak hanya bergantung pada dalam permainan bola voli (Asnaldi , 2020 ; Destriana et al ., 2. Jurnal Keolahragaan, 11(1), 15–25.

Nurfalah, S., Hanif, A. S., & Satyakarnawijaya, Y. (2019). Model Latihan Smash Dalam Permainan Bola Voli Untuk Pemula. Jurnal Pendidikan Olahraga, 8(1), 15. https://doi.org/10.31571/jpo.v8i1.1216

Prabawa, I. P. A., Vanagosi, K. D., Darmada, I. M., & Widiantari, N. L. G. (2021). Hubungan Antara Tinggi Badan dan Kekuatan Otot Lengan terhadap Ketepatan Smash Pada Era Adaptasi Kebiasaan Baru. Gelora: Jurnal Pendidikan Olahraga Dan Kesehatan IKIP Mataram, 9(2), 54–60.

Ramawan, K., Hidayat, S., & Darmawan, G. E. B. (2020). Hubungan Tinggi Badan, Power Otot Tungkai Dan Power Otot Lengan Terhadap Kemampuan Smash Pada Club Bola Voli Citroen Pedawa Tahun 2020. Jurnal Pendidikan Kepelatihan Olahraga Undiksha, 11(3), 30–36. https://doi.org/10.23887/jjpko.v11i3.27782

Shalahudin, F., & Sifaq, A. (2023). Profil Tinggi Badan, Berat Bada, Tinggi Lompatan dan Power Tungkai pads Atlet Putra U-16-17 PBV Jayaraya Sidoarjo. JPO: Jurnal Prestasi Olahraga, 6(1), 20–24.