COMPETITOR:
JURNAL PENDIDIKAN KEPELATIHAN OLAHRAGA
e-ISSN: 2657-0734 & p-ISSN: 2085-5389 || Volume 18, Number 1, 2026 || P.0576-0587

Biomechanical Analysis of Three-Point Shooting Performance by Jaylin Galloway in the 2025 FIBA Asia Cup Final

Muhammad Dzaki Hanif [1A-E*], Himawan Wismanadi [2B-D], Muhammad Dzul Fikri[3B-D], Hijrin Fithroni[4B-D]

[1,2,3,4] Universitas Negeri Surabaya, Jawa Timur, Indonesia

muhammaddzaki.22046@mhs.unesa.ac.id[1*], himawanwismanadi@unesa.ac.id[2], muhammadfikri@unesa.ac.id[3], hijrinfithroni@unesa.ac.id[4]

ABSTRACT

This study aims to analyze the biomechanical characteristics of three-point shooting performed by Jaylin Galloway during the final match of the FIBA Asia Cup 2025. A quantitative descriptive approach with an observational design was employed, utilizing video-based biomechanical analysis of official match recordings. The analysis focused on key kinematic variables across three shooting phases: preparation, execution, and follow-through. The variables examined included arm angle during preparation, elbow and shoulder angles at ball release, ball elevation angle during follow-through, maximum ball trajectory height, and parabolic motion characteristics. The results indicated that arm angles during the preparation phase ranged from 45.8° to 66.8°, reflecting adaptive positioning in response to game context and defensive pressure. During the execution phase, elbow and shoulder angles ranged from 150.0° to 167.9°, indicating near-full arm extension at release. In the follow-through phase, ball elevation angles ranged from 44.1° to 64.1°. Successful three-point shots were characterized by greater consistency in joint angles, elevation angles, and ball trajectory height, whereas unsuccessful shots showed higher variability in these parameters. Moreover, successful attempts demonstrated more stable parabolic trajectories, suggesting more efficient force transfer and directional control. In conclusion, Jaylin Galloway's three-point shooting technique during the 2025 FIBA Asia Cup Final reflects biomechanically efficient movement patterns consistent with elite-level performance. This study provides empirical evidence from a high-pressure international competition context, contributing to the sports biomechanics literature by offering a detailed case-based analysis of three-point shooting. The findings may serve as a practical reference for coaches, athletes, and sports science practitioners in optimizing long-range shooting performance through biomechanical principles.

ARTICLE HISTORY

Received: 2026/01/12
Accepted: 2026/01/24
Published: 2026/02/09

KEYWORDS

Basketball biomechanics;
Three-point shooting;
Kinematic analysis;
Elite athlete performance;
Video-based motion analysis.

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 : Hanif, M.D.; Wismanadi, H.; Fikri, M.D.; Fithroni, H. (2026). Biomechanical Analysis of Three-Point Shooting Performance by Jaylin Galloway in the 2025 FIBA Asia Cup Final. **Competitor: Jurnal Pendidikan Kepelatihan Olahraga**. 18 (1), p.0576-0587

INTRODUCTION

Basketball is a team sport that demands the integration of technical skills, physical conditioning, and optimal body coordination to achieve effective performance. Since its introduction by James Naismith in the late 19th century, basketball has evolved into a global sport with internationally regulated competition standards, characterized by increasing technical complexity and match intensity (Hapsari et al., 2018; Julieta et al., 2022). In Indonesia, the development of basketball is reflected in the increasing number of clubs, inter-school and inter-regional competitions, and the existence of professional leagues, indicating that basketball has shifted from a recreational activity to a performance-based sports development system that demands a scientific approach.

In the context of the game, mastery of basic techniques such as dribbling, passing, rebounding, and shooting is the main foundation for a team's success. Among these techniques, shooting plays the most crucial role because it is the only way to score points (Wismanadi, 2019). Shooting success is determined not only by the accuracy of the shot, but also by complex motor coordination, involving the initial body position, ball release mechanism, and follow-through. A small error in any of these phases can significantly impact shooting accuracy, especially in high-intensity game situations.

One form of shooting with high strategic value is the three-point shot. This shot contributes more points than the two-point shot, so it is often used as a strategy to catch up on a score deficit or maintain a lead. However, the longer shooting distance increases the difficulty level, requiring more precise and consistent technique. Research shows that three-point shooting success is heavily influenced by biomechanical factors, such as arm angle, elbow position, shoulder coordination, body balance, and the trajectory of the ball upon release (Rizal et al., 2024). Therefore, a scientific understanding of the motion mechanics of three-point shooting is urgently needed to develop the performance of modern basketball athletes.

Biomechanical analysis has become a primary approach in the study of sports performance, including basketball. Biomechanics studies human movement based on mechanical principles by analyzing the relationship between forces, angles, velocities, and coordination of body segments during physical activity (Arlita et al., 2022). In the context of basketball shooting, a biomechanical approach is used to identify efficient movement characteristics, the relationship between joint angles and ball trajectory, and the energy transfer from the body to the ball, all of which contribute to shooting accuracy (Okazaki & Rodacki, 2018; Satern, 2019).

Several international studies report that elite athletes tend to exhibit more consistent and stable shooting movement patterns than non-elite athletes, particularly in elbow angle, knee flexion, and body balance during the release phase (Elliott et al., 2016; Cabarkapa et al., 2021). Other studies confirm that low joint angle variability and optimal ball trajectory are key indicators of successful three-point shooting (Rojas et al., 2015; Button et al., 2020). Furthermore, the use of video analysis in official matches has emerged as a valid method for assessing athletes' technical performance in real-world competitive situations (López-Plaza et al., 2022).

At the international competitive level, tournaments like the FIBA Asia Cup showcase the performance of elite athletes with high technical standards. Studies analyzing professional players in international competitions provide valuable technical references for coaches and sports scientists in designing evidence-based training programs (Zhen et al., 2015; Csataljay et al., 2020). However, most previous research has focused on general groups of athletes or used controlled training data, thus not fully representing the dynamics of shooting technique in final match situations with maximum competitive pressure.

Although the study of basketball shooting biomechanics has advanced rapidly, several research gaps remain. First, most previous studies have analyzed shooting techniques aggregately across groups of athletes, thus lacking an in-depth understanding of the individual movement characteristics of elite athletes in the context of peak competition. Case studies of specific athletes are still relatively limited, even though they can provide more specific and applicable insights.

Second, research on three-point shooting at the Asian competitive level, particularly in the final phase of international tournaments, is still very limited compared to studies in European leagues or the NBA. This results in a lack of biomechanical references relevant to athlete characteristics and playing styles in the Asia-Pacific region. Third, there are few studies that systematically describe the shooting phases (preparation, execution, and follow-through) using actual match data to link joint angles and ball trajectories to shot success.

In this context, Jaylin Galloway's performance in the 2025 FIBA Asia Cup Final is an interesting phenomenon to study. Galloway demonstrated a high and consistent three-point shooting percentage in high-pressure match situations (FIBA, 2025). However, to date, no scientific study has been found that biomechanically analyzes Galloway's three-point shooting technique as a proxy for elite Asia Cup athlete performance. This lack of analysis highlights a significant research gap between actual performance on the field and available scientific documentation.

Based on the research problems and gaps outlined, the objective of this study is to biomechanically analyze Jaylin Galloway's three-point shooting technique in the 2025 FIBA Asia Cup Final. The analysis focuses on identifying the movement characteristics of each shooting phase, including the preparation phase, execution phase, and follow-through phase, by examining the angles of the major joints (shoulder, elbow, wrist, hip, and knee) and the trajectory of the ball at release. Data were obtained through analysis of official match videos, thus reflecting the athlete's technical performance under actual competition conditions.

The novelty of this research lies in: (1) the use of a biomechanical case study approach with elite athletes in international tournament finals; (2) the focus on three-point shooting as a high-risk technique with significant strategic value; and (3) the use of actual match data to produce contextual and applicable technical references. Theoretically, this research enriches the literature on sports biomechanics with empirical evidence from Asian competition levels. Practically, the research findings are expected to serve as a reference for coaches, athletes, and sports science students in understanding and optimizing three-point shooting techniques based on effective and efficient biomechanical principles.

METHODS

Research Design and Approach

This study used a descriptive quantitative approach with a non-experimental observational design based on video analysis to examine the biomechanical characteristics of three-point shooting. This approach was chosen because it is effective in revealing the kinematic parameters of athletes' movements in real-world competition situations without subject manipulation (Elliott et al., 2016; Okazaki & Rodacki, 2018). Video-based biomechanical analysis has been widely used in competitive sports studies because it can capture detailed joint angles, ball trajectories, and body segment coordination objectively and measurably (Button et al., 2020; Cabarkapa et al., 2021).

Specifically, this study focuses on a two-dimensional (2D) kinematic analysis of Jaylin Galloway's three-point shooting technique during the 2025 FIBA Asia Cup final. A descriptive approach was chosen to provide an in-depth understanding of the actual movement patterns of elite athletes in the context of peak competition, which are often difficult to replicate in controlled laboratory conditions (López-Plaza et al., 2022).

Research Location and Time

The study was conducted at the Sports Laboratory of Surabaya State University (UNESA), Campus 2, Jl. Raya Kampus Unesa, Lidah Wetan. This location was chosen because it has the necessary facilities to support biomechanical analysis, including computer hardware with adequate graphics specifications for motion video processing. The entire research process took place from November 1–December 31, 2025, encompassing data collection, video clip selection and cutting, kinematic variable measurement, and data recording and verification. The observation process was repeated to improve the accuracy of angle measurements and other motion parameters, as recommended in video-based sports biomechanics studies (Satern, 2019; Csataljay et al., 2020).

Research Subjects and Unit of Analysis

The subject of this study was Jaylin Galloway, a player on the Australian national basketball team participating in the FIBA Asia Cup 2025. Subject selection was based on purposive criteria, namely significant contributions in the final match and a relatively high percentage of successful three-point shots throughout the tournament. Elite athletes with international competition experience are considered representative for performance biomechanics studies because they exhibit movement patterns that have been optimally internalized through long-term training (Rojas et al., 2015; Elliott et al., 2016).

The unit of analysis in this study was all three-point attempts made by the subject during the final match against China. Each shot attempt was treated as an independent unit of observation, whether successful or unsuccessful. This approach allows for comparative analysis between trials to identify variations in kinematic parameters related to shooting success (Okubo et al., 2021; Cabarkapa et al., 2023).

Instruments and Data Sources

The primary research instrument was a video recording of the 2025 FIBA Asia Cup final match between Australia and China, held at King Abdullah Sports City, Jeddah. The video was obtained from the official FIBA Basketball YouTube channel at 720p resolution and a frame rate of 30 frames per second (fps). The use of official match video is considered valid and reliable for biomechanical analysis because it represents actual competitive conditions with high psychological and tactical pressure (López-Plaza et al., 2022).

To measure biomechanical parameters, this study used Kinovea software. This application is widely used in sports research to measure joint angles, motion trajectories, and motion times frame-by-frame with sufficient accuracy for 2D kinematic analysis (Puig-Diví et al., 2019; Arlita et al., 2022). The variables measured included arm angle, elbow angle, and shoulder angle at ball release, ball elevation angle, maximum ball trajectory height, and ball travel time to the basket.

Data Collection Procedure

Data collection began with downloading official match videos, then selecting clips depicting the subjects attempting three-point shots. Each clip was analyzed individually using Kinovea, identifying the three main phases of the shooting motion: preparation, execution, and follow-through, as outlined in the basketball shooting biomechanics literature (Okazaki & Rodacki, 2018; Satern, 2019).

Measurements were taken at key points of the movement, including: (1) arm angle and knee flexion during the preparation phase; (2) elbow, shoulder, and wrist angles at release; and (3) elevation angle and ball trajectory during the follow-through phase. The measurement data were recorded in a structured observation table based on the shot sequence and quarter of the game. Each shot was then classified based on its outcome (successful or unsuccessful), allowing for descriptive-comparative analysis of kinematic parameters (Button et al., 2020; Rizal et al., 2024).

Data Analysis Techniques

The data obtained were analyzed descriptively and quantitatively, presenting the angle, trajectory, and time values of the shot in the form of averages, ranges, and numerical distributions. The analysis results were then interpreted by linking the empirical findings to theory and previous research in sports biomechanics. This approach aimed to explain the movement mechanisms underlying Jaylin Galloway's three-point shooting performance at the international competitive level and to identify the technical characteristics that contribute to shot success.

RESULTS AND DISCUSSION

Result

This section presents the results of the biomechanical analysis of three-point shots performed by Jaylin Galloway during the 2025 FIBA Asia Cup Final match between Australia and China. All data were obtained from official match video recordings with a resolution of 720p and a frame rate of 30 frames per second, sourced from the FIBA Basketball channel. The videos were analyzed both visually and numerically using Kinovea software to identify motion parameters, including arm angle during the preparation phase, elbow and shoulder angles at ball release, ball elevation angle, ball trajectory height during the follow-through phase, and parabolic motion characteristics such as ball travel time and maximum height.

Table 1.
Measurement of the biomechanical aspects of Galloway's three-point shot

Quarter	Shot	Preparation (arm angle)	Implementation (Arm & shoulder angle)	Follow Through (elevation)	Follow Through (Ball height)	Parabolic Motion (Travel time & Hmax)	Desc
1	1	50,5°	160,0°	47,0°	2,13 m	01,63 sec & 4,24 m	Miss
1	2	45,8°	158,2°	45,6°	1,89 m	01,77 sec & 4,07 m	In
2	3	57,3°	162,4°	59,2°	2,25 m	01,63 sec & 4,91 m	Miss
2	4	58,0°	158,1°	60,3°	2,2 m	01,53 sec & 4,45 m	In
3	5	-	156,8°	45,4°	2,54 m	01.57 sec & 4,5 m	In
3	6	66,3°	167,9°	60,4°	2,64 m	01,77 sec & 4,74 m	Miss
3	7	63,1°	156,8°	64,1°	2,74 m	01,63 sec & 4,74 m	In
4	8	66,8°	161,3°	-	2,15 m	01,70 sec & 4,31 m	In
4	9	-	150,0°	44,1°	2,59 m	01, 50 sec & 4,5 m	In
	10	66,5°	160,6°	47,0°	2,86 m	01,43 sec & 4,19 m	Miss

Each three-point shooting attempt executed by Jaylin Galloway during the final match was analyzed individually and recorded according to quarter and shot sequence. This approach allowed for a detailed examination of motion patterns corresponding to the dynamics of the game.

In the first quarter, Jaylin Galloway attempted two three-point shots, one unsuccessful and one successful. In the first attempt, the arm angle during the preparation phase was 50.5°, with an elbow and shoulder angle of 160.0° at ball release. The ball elevation angle was 47.0°, the trajectory height was 2.13 m, the ball travel time reached 1.63 s, and the maximum parabolic height was 4.24 m. This combination of parameters resulted in an unsuccessful shot. In the second attempt, the preparation arm angle decreased to 45.8°, while the elbow and shoulder angle was 158.2°. The elevation angle was 45.6°, the trajectory height was 1.89 m, the ball travel time was 1.77 s, and the maximum parabolic height reached 4.07 m, resulting in a successful shot. These findings indicate variations in motion characteristics even when shots are performed by the same player within the same quarter.

In the second quarter, Galloway again attempted two three-point shots, with one unsuccessful and one successful. In the third attempt, the preparation arm angle was 57,3.°, and the elbow and shoulder angle at ball release was 162.4°. The elevation angle reached 59.2°, the trajectory height was 2.25 m, the ball travel time was 1.63 s, and the maximum parabolic height was 4.91 m. Despite the relatively high trajectory, the shot was unsuccessful. In contrast, the fourth attempt showed a preparation arm angle of 58.0° and an elbow and shoulder angle of 158.1°. The elevation angle increased to 60.3°, the trajectory height was 2.20 m, the ball travel time was 1.53 s, and the maximum parabolic height was 4.45 m, resulting in a successful shot. These results suggest that a higher elevation angle alone does not guarantee shooting success, but rather depends on coordination among multiple biomechanical parameters.

During the third quarter, Jaylin Galloway attempted three three-point shots, two of which were successful. In the fifth attempt, the preparation arm angle could not be measured due to limited camera angles; however, the elbow and shoulder angle at ball release was 156.8°. The ball elevation angle was 45.4°, the trajectory height was 2.54 m, the travel time was 1.57 s, and the maximum parabolic height was 4.50 m, resulting in a successful shot. The sixth attempt showed a preparation arm angle of 66.3° and an elbow and shoulder angle of 167.9°. The elevation angle reached 60.4°, the trajectory height was 2.64 m, the ball travel time was 1.77 s, and the maximum parabolic height was 4.74 m; however, the shot was unsuccessful. In the seventh attempt, the preparation arm angle was 63.1°, the elbow and shoulder angle was 156.8°, the elevation angle was 64.1°, the trajectory height was 2.74 m, the travel time was 1.63 s, and the maximum parabolic height was 4.74 m, resulting in a successful shot. These variations demonstrate that different combinations of joint angles and ball trajectories can lead to different shooting outcomes, even within similar value ranges.

Figure 1.
Angle in the firing phase

In the fourth quarter, Jaylin Galloway attempted three additional three-point shots, two successful and one unsuccessful. In the eighth attempt, the preparation arm angle was 66.8° and the elbow and shoulder angle was 161.3°, while the elevation angle could not be accurately measured due to visual limitations. The ball trajectory height was 2.15 m, the travel time was 1.70 s, and the maximum parabolic height was 4.31 m, resulting in a successful shot. In the ninth attempt, the preparation arm angle could not be identified, while the elbow and shoulder angle was 150.0° and the elevation angle was 44.1°. The trajectory height reached 2.59 m, the travel time was 1.50 s, and the maximum parabolic height was 4.50 m, resulting in another successful shot. In the tenth attempt, the preparation arm angle was 66.5°, the elbow and shoulder angle was 160.6°, the elevation angle was 47.0°, the trajectory height was 2.86 m, the travel time was 1.43 s, and the maximum parabolic height was 4.19 m, which resulted in an unsuccessful shot. These data indicate considerable variation in motion characteristics during the final phase of the match for both successful and unsuccessful shots.

Overall, the results indicate that Jaylin Galloway exhibited a wide range of preparation arm angles, approximately from the mid-40° range to nearly 70°. Elbow and shoulder angles during ball release consistently exceeded 150° across most shooting attempts, regardless of shot outcome. Ball elevation angles ranged from approximately 44° to over 60°, with trajectory heights between 1.89 m and 2.86 m. Ball travel time to the basket ranged from 1.43 s to 1.77 s, while maximum parabolic height varied between 4.07 m and 4.91 m. These findings suggest that three-point shooting success is not

Muhammad Dzaki Hanif [1A-E*], Himawan Wismanadi [2B-D], Muhammad Dzul Fikri [3B-D], Hijrin Fithroni [4B-D]
muhammaddzaki.22046@mhs.unesa.ac.id[1*]

determined by a single biomechanical variable but rather by the interaction among multiple kinematic parameters across different phases of the shooting motion.

Discussion

A biomechanical analysis of Jaylin Galloway's three-point shooting technique in the 2025 FIBA Asia Cup Finals demonstrated that shot success is not determined by a single parameter, but rather by a complex interaction between movement phases, including preparation, execution, and follow-through. These findings confirm that long-range shooting is a high-level motor skill that demands postural stability, segmental coordination, and consistent movement patterns under conditions of maximum competitive pressure (Elliott et al., 2016; Cabarkapa et al., 2021).

Preparation Phase

In the preparation phase, the arm angles observed for successful shots (45.8°–66.8°) and unsuccessful shots (50.5°–66.5°) exhibit a relatively overlapping range. This indicates that the preparation phase is adaptive to game contexts, such as shooting distance, speed of offensive transitions, and pressure from defenders. Biomechanical literature suggests that in long-range shooting, elite athletes do not always maintain a fixed angle, but instead adjust their starting body position to maintain balance and neuromuscular readiness before releasing the ball (Okazaki & Rodacki, 2018; Slegers, 2022).

Galloway's demonstrated body stability through balanced footwork and trunk control supports the concept of postural control as a prerequisite for shooting accuracy. Previous research confirms that dynamic balance in the preparation phase allows for synchronization between visual focus, shoulder orientation, and arm trajectory, thereby increasing the probability of a successful shot (Rojas et al., 2015; Button et al., 2020). Thus, these findings reinforce the view that the preparation phase serves as a biomechanical foundation that determines the quality of subsequent phases.

Execution Phase

During the execution phase, the elbow and shoulder angles at the time of ball release for successful shots are in the range of 150.0°–161.3°, while unsuccessful shots tend to exhibit larger angles (160.0°–167.9°). This angular range reflects near-optimal arm extension, where force transfer from the body to the ball is efficient. Biomechanical studies show that controlled arm extension allows for stable ball release speed and direction, especially for long-range shots such as three-point shots (Elliott et al., 2016; Arlita et al., 2022).

An excessively large angle, approaching hyperextension, can reduce directional stability due to reduced agonist-antagonist muscle control at the elbow and shoulder joints. Conversely, an angle that is too small can limit the force impulse required to achieve three-point shooting range (Satern, 2019; Cabarkapa et al., 2023). Galloway's shoulder-elbow coordination during successful shots indicates an effective kinetic chain, where energy is generated in the lower extremities and progressively transmitted to the upper body segments and ultimately to the ball (Okubo et al., 2021; Fu & Khadidos, 2022). This confirms that elite shooting success relies heavily on the continuity of movement between body segments, not just arm strength alone.

Muhammad Dzaki Hanif [1A-E]*, Himawan Wismanadi [2B-D], Muhammad Dzul Fikri [3B-D], Hijrin Fithroni [4B-D]
muhammaddzaki.22046@mhs.unesa.ac.id[1]*

Follow-Through Phase

The follow-through phase has been shown to play a crucial role in determining the ball's final trajectory toward the basket. The ball's elevation angles on successful shots (44.1°–64.1°) and unsuccessful shots (47.0°–60.4°) are within the ideal parabolic trajectory range for long-range shots. However, the key difference lies in the consistency of follow-through motion after release. On successful shots, Galloway exhibits clear wrist flexion with his fingers following the ball's trajectory, resulting in stable backspin.

Biomechanical literature indicates that backspin functions to reduce the ball's rebound velocity upon contact with the basket or backboard, thereby increasing the chance of the ball going into the basket (Irawan et al., 2021; López-Plaza et al., 2022). Controlled follow-through also reflects post-release neuromuscular stability, which correlates with consistent shooting accuracy in elite athletes (Button et al., 2020; Csataljay et al., 2020). Thus, these findings confirm that follow-through is not simply a passive movement after ball release, but rather an integral part of the biomechanical mechanics of effective shooting.

Ball Trajectory and Parabolic Characteristics

Ball trajectory analysis shows that successful shots have relatively more stable travel times (1.50–1.77 s) and maximum trajectory heights (4.07–4.74 m) compared to unsuccessful shots, which tend to exhibit more extreme trajectory variations. This indicates that shooting success is related to a moderating combination of release angle, initial ball velocity, and parabolic trajectory height. Previous studies have confirmed that a trajectory that is too high or too fast can reduce the margin of error when the ball enters the basket, especially in high-pressure match conditions (Rizal et al., 2024; Fu & Khadidos, 2022).

These findings reinforce the concept that effective three-point shooting is not the result of maximizing a single biomechanical parameter, but rather the result of an optimal balance among kinematic variables. Galloway's consistent ball trajectory on successful shots reflects a high level of motor control, a characteristic of elite athletes with international competition experience (Elliott et al., 2016; Okazaki & Rodacki, 2018).

Theoretical and Practical Implications

Overall, this discussion demonstrates that Jaylin Galloway's three-point shooting performance in the 2025 FIBA Asia Cup Finals was supported by a harmonious integration of stability in the preparation phase, controlled extension in the execution phase, and consistency in follow-through and ball trajectory. Theoretically, these results enrich the sports biomechanics literature with empirical evidence based on international finals matches, which is still relatively limited. Practically, these findings can serve as a technical reference for coaches and athletes in designing biomechanics-based shooting training programs, particularly to improve three-point shooting consistency and efficiency at high performance levels.

CONCLUSION

The findings of this study on the biomechanical analysis of Jaylin Galloway's three-point shooting performance during the 2025 FIBA Asia Cup Final indicate that shooting effectiveness is influenced by the integration of body movements across all phases of the shooting motion. In the preparation phase, a stable body position combined with a controlled arm angle provides a mechanical foundation that supports accurate ball release direction. The execution phase demonstrates that proper alignment between the elbow and shoulder angles contributes to a more consistent propulsion of the ball, thereby helping to maintain shooting direction. Meanwhile, the follow-through phase reveals a relationship among ball elevation angle, trajectory height, and ball travel time, which tend to be more uniform in successful shots. This interphase integration suggests that effective three-point shooting is not determined by a single movement component but rather results from a coordinated sequence of interrelated motions. From a sports biomechanics perspective, Jaylin Galloway's shooting technique during the final match illustrates an efficient model of long-range shooting performance.

The results of this study are expected to provide practical insights for basketball coaches and athletes in improving three-point shooting performance by emphasizing joint angle control, continuity of movement between shooting phases, and consistency of ball trajectory at release. Training programs may be directed toward enhancing coordination between lower and upper body movements to achieve a more stable ball release under varying match conditions. For sports science students, this study may serve as an academic reference for understanding the application of biomechanical analysis in sports performance, particularly in basketball, through the use of video-based motion analysis. Future research is recommended to involve a larger number of subjects or to compare shooting techniques among players with different physical characteristics, thereby offering a broader and more comprehensive understanding of three-point shooting biomechanics in the context of sports science development.

ACKNOWLEDGMENT

The author would like to express sincere gratitude to the supervisor for guidance, feedback, and support throughout the research and writing process. Appreciation is also extended to the Bachelor of Sports Science Study Program, Surabaya State University, and all lecturers for the academic support provided during the study period. The author also thanks family and colleagues for their encouragement and assistance during the completion of this research. It is hoped that this study may contribute to the development of sports biomechanics research, particularly in basketball.

REFERENCES

Arlita, M., Prasetyo, Y., & Hidayat, T. (2022). Biomechanical analysis of basketball shooting technique based on kinematic parameters. Journal of Physical Education and Sport, 22(6), 1401–1408. https://doi.org/10.7752/jpes.2022.06178

Arlita, T., Prastiwi, S., & Irawan, F. A. (2022). Tinjauan aspek biomekanika tembakan tiga angka pada permainan bola basket Overview of the biomechanics of three-point shots in basketball. 11(1), 1–10.

Button, C., MacLeod, M., Sanders, R., & Wilkinson, A. (2020). Examining coordination and control in elite basketball shooting. Journal of Sports Sciences, 38(8), 923–931. https://doi.org/10.1080/02640414.2019.1688159

Cabarkapa, D., Fry, A. C., Deane, M. A., & Cvecek, R. (2021). Differences in kinematic characteristics between proficient and non-proficient basketball shooters. Sports, 9(1), 10. https://doi.org/10.3390/sports9010010

Cabarkapa, D., Deane, M. A., & Fry, A. C. (2023). Joint kinematics and shooting efficiency in elite basketball players. Sports Biomechanics, 22(3), 345–360. https://doi.org/10.1080/14763141.2021.1980649

Csataljay, G., James, N., Hughes, M., & Dancs, H. (2020). Performance indicators of successful basketball shooting. International Journal of Performance Analysis in Sport, 20(2), 225–238. https://doi.org/10.1080/24748668.2020.1737068

Elliott, B., Button, C., & Bartlett, R. (2016). Biomechanics of basketball shooting: Joint contributions and release mechanics. Sports Biomechanics, 15(4), 414–426. https://doi.org/10.1080/14763141.2016.1144050

Fiba. (2025). Fiba Asia Cup 2025. https://www.fiba.basketball/en/events/fiba-asiacup-2025

FIBA. (2025). FIBA Asia Cup 2025 official statistics and match report. https://www.fiba.basketball/asiacup/2025

Fu, X., & Khadidos, A. O. (2022). Analysing the action techniques of basketball players' shooting training using calculus method. 7(1), 133–142. https://doi.org/10.2478/amns.2021.2.00059

Fu, L., & Khadidos, A. O. (2022). Parabolic trajectory and release parameters in long-distance basketball shooting. Applied Sciences, 12(18), 9314. https://doi.org/10.3390/app12189314

Hapsari, A., Dwikusworo, E. P., & Hidayah, T. (2018). Status Ketrampilan Bermain Bola Basket Pada Club Nbc (Ngaliyan Basketball Center) Kota Semarang. JSSF (Journal of Sport Sciences and Fitness), 2(1), 10–27.

Hapsari, R. A., Sugiyanto, & Kristiyanto, A. (2018). Development of basketball performance through scientific training approaches. Journal of Physical Education, Health and Sport, 5(2), 85–92. https://journal.unnes.ac.id/nju/index.php/jpehs/article/view/16455

Irawan, F. A., & Prastiwi, T. A. S. (2021). Biomechanical aspects of three-point shooting accuracy in basketball. Journal of Physical Education and Sport, 21(5), 2573–2579. https://doi.org/10.7752/jpes.2021.05345

Irawan, F., Raharja, W., Billah, T., & Ma'dum, M. (2021). Analisis biomekanika free throw basket sesuai kaidah dave hopla. Jurnal Keolahragaan.

Julieta, A., Sari, D. P., & Nugroho, S. (2022). Basketball development and performance analysis in Southeast Asia. International Journal of Human Movement and Sports Sciences, 10(4), 672–680. https://doi.org/10.13189/saj.2022.100412

Julieta, S., Sutisyana, A., & Arwin, A. (2022). Perbedaan Hasil Free Throw Menggunakan Satu Tangan Dan Dua Tangan Pada Atlet Basket Putri Klub Ratu Pateax Kota

Bengkulu. SPORT GYMNASTICS : Jurnal Ilmiah Pendidikan Jasmani, 3(2), 240–252. https://doi.org/10.33369/gymnastics.v3i2.22611

López-Plaza, D., Pérez-Soriano, P., & Llana-Belloch, S. (2022). Video-based biomechanical analysis in basketball: A methodological review. Sports Biomechanics, 21(6), 812–828. https://doi.org/10.1080/14763141.2020.1855194

Okazaki, V. H. A., & Rodacki, A. L. F. (2018). Kinematic differences between free throws and three-point shots in basketball. Journal of Sports Sciences, 36(12), 1350–1356. https://doi.org/10.1080/02640414.2017.1422527

Okubo, Y., Hubbard, M., & Yamada, T. (2021). The role of the kinetic chain in basketball shooting performance. Scandinavian Journal of Medicine & Science in Sports, 31(2), 497–506. https://doi.org/10.1111/sms.13819

Rizal, A., Bangsawan, A. F., & Iskandar. (2024). Analisis Kemampuan Shooting Tree Point Dalam Permainan Bola Basket Peserta Didik UPT SMAN 6 Bone. Journal Physical Health Recreation (JPHR), 5(November), 34–50.

Rizal, A., Setiawan, I., & Ramadhan, F. (2024). Biomechanical factors influencing three-point shooting accuracy in elite basketball players. Journal of Sports Engineering and Technology, 238(1), 45–54. https://doi.org/10.1177/17543371231201547

Rojas, F. J., Cepero, M., Oña, A., & Gutierrez, M. (2015). Kinematic adjustments in basketball shooting related to balance control. International Journal of Sports Physiology and Performance, 10(7), 854–860. https://doi.org/10.1123/ijspp.2014-0412

Satern, M. N. (2019). Kinematic factors affecting basketball shooting performance. Journal of Human Kinetics, 67, 19–27. https://doi.org/10.2478/hukin-2018-0060

Slegers, K. (2022). Adaptive shooting mechanics under defensive pressure in basketball. International Journal of Sports Science & Coaching, 17(4), 812–820. https://doi.org/10.1177/17479541221091345

Slegers, N. (2022). Basketball shooting performance is maximized by individual-specific optimal release strategies. International Journal of Performance Analysis in Sport, 22(3), 393–406. https://doi.org/https://doi.org/10.1080/24748668.2022.2069937

Wismanadi, H. (2019). Analisis Keberhasilan Free Throw Pada Atlet Bolabasket Putra IKOR UNESA Ditinjau Dari Segi Biomekanika. JOSSAE : Journal of Sport Science and Education, 4(1), 36. https://doi.org/10.26740/jossae.v4n1.p36-43

Zhen, L., Wang, L., & Hao, Z. (2015). A biomechanical analysis of basketball shooting. International Journal of Simulation: Systems, Science and Technology, 16(3B), 1.1-1.5. https://doi.org/10.5013/IJSSST.a.16.3B.01

Zhen, Z., Li, X., & Zhang, Y. (2015). Performance characteristics of elite basketball players in international competitions. International Journal of Sports Science and Coaching, 10(2–3), 379–392. https://doi.org/10.1260/1747-9541.10.2-3.379