



Kinematic Factors Affecting Good Length Bowling of Under-25 Wrist Spin Bowlers in Rathnapura District

Mulkapuge Don Nipun Lakshan^{1ABCD}, Arangala Witharanalage Suraj Chandana^{1ABCD}, Hembadura Dewna Randini Silva^{1ABCD}

¹ Department of Sports Science and Physical Education, Sabaragamuwa University, Belihuloya, Sri Lanka

Authors' Contribution: A – Study design; B – Data collection; C – Statistical analysis; D – Manuscript Preparation; E – Funds Collection.

Corresponding Author: Mulkapuge Don Nipun Lakshan, nipunlakshaaan@gmail.com

Received 05 May 2026

Accepted 06 June 2026

DOI <https://doi.org/10.26740/jses.v9n2.p100-108>

ABSTRACTS

Purpose	This study investigated the kinematic variables associated with good length bowling among under-25 wrist-spin bowlers in Rathnapura District, Sri Lanka. The main objective was to identify the biomechanical variables associated with good length and non-good length deliveries.
Materials and Methods	Five under-25 wrist-spin bowlers were selected through purposive sampling from district-level club cricket teams in Rathnapura District. Three-dimensional kinematic analysis was conducted on the bowling actions using a Qualisys motion capture system at 100 Hz. Reflective markers were placed on the major joints of the upper and lower limbs. A total of 96 bowling actions were analyzed, consisting of good length deliveries (n=14) and non-good length deliveries (n=82). Joint angles, angular displacements, and peak angular velocities from front foot contact (FFC) to ball release (BR) were calculated using three-dimensional vector analysis. Since the data were non-normal and the sample sizes were unequal, and repeated deliveries were obtained from a small number of bowlers, non-parametric statistical procedures were employed. Mann-Whitney U test and Spearman's rank correlation were conducted at $\alpha = 0.05$.
Result	The results revealed that wrist angular displacement from FFC to BR was the only variable that significantly differentiated good length and non-good length deliveries ($p = 0.032$). A moderate negative correlation was found between wrist angular displacement and delivery outcome ($\rho = -0.28$, $p = 0.030$). No significant differences were found in the proximal segment displacements and peak angular velocities. These findings emphasize the role of the distal segment in wrist-spin bowling in terms of wrist angular displacement in achieving good length in bowling.
Conclusion	The findings should be interpreted cautiously due to the limited sample size and nested structure of repeated deliveries within bowlers. Further research with larger and more diverse samples is required to confirm these preliminary observations.
Keywords	Wrist spin bowling; Kinematic analysis; Angular displacement; Length accuracy; Kinetic chain.

INTRODUCTION

Cricket is a widely loved sport where the interaction between the bat and ball is key to determining match results. One important aspect of the game is how bowlers can deliver the ball accurately and with control, which is crucial for achieving good performance (Majeed Bhat, 2017). Among the different bowling styles, wrist spin bowling is especially important for strategy. These bowlers can put significant spin on the ball, causing it to drift, dip, and turn, which can confuse batsmen and affect their timing and shot choices (Ferdinands et al., 2023; Fuss et al., 2023). This blend of deception and control has made skilled wrist spin bowlers highly valued in all formats of modern cricket, including Test and Twenty20 matches (Kerruish et al., 2025).

A key factor for success in bowling, no matter the style, is the ability to consistently deliver the ball at a "good length." This area is tactically optimal and increases the chances of causing batsmen to make mistakes. Deliveries landing in this zone lead to dismissals like bowled, leg-before-wicket (LBW), or catches, while also limiting scoring chances for the batting team (Callaghan et al., 2019; Jamil et al., 2023). Importantly, the idea of "good length" is not fixed; it is dynamic and shaped by various situational, environmental, and strategic factors (Singh et al., 2023). These factors can include the match format, pitch characteristics, geographical location, and the age and skill level of the players (Callaghan et al., 2019; Stretch, 2014). Studies have provided different definitions for bowling lengths, like "good length" defined as 4-7m from the batter's stumps and "full length" as 0-4m for pace bowlers (Callaghan et al., 2019), or "good length" as 4m-8m from the stumps in a coaching context (Connor et al., 2020). This variation indicates that the ideal length may require a customized approach for specific contexts, such as player development stages or playing conditions.

For this study, which focuses on under-25 wrist spinners participating in longer-format cricket in the Rathnapura district of Sri Lanka, a specific "good length" area has been defined. This definition considers the unique developmental stage of the athletes (Stretch, 2014), the requirements of Test cricket, and the local playing conditions in Rathnapura. Although there are general definitions, the lack of relevant academic literature for this specific group necessitates a contextual approach.

Therefore, in this research, the "good length" area was determined to be 3.2m to 4m from the stumps, a measurement established through direct consultation with a national spin bowling coach. This approach reflects the understanding that coaching expertise is vital in defining effective bowling strategies and parameters (Connor et al., 2020; Tissera et al., 2024).

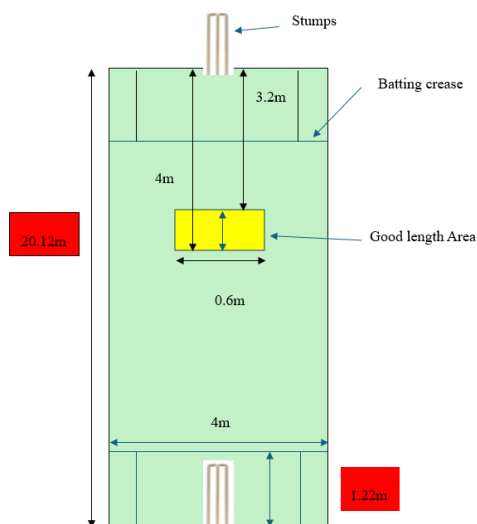


Figure 1. Good Length Area

For wrist spin bowlers, maintaining accuracy is especially tough because they need to control spin, flight, and trajectory at the same time. This makes executing a consistent good length delivery a complex skill that demands refined technical control and good body movement (Majeed Bhat, 2017). Bowlers who can repeatedly deliver to this strategic area tend to generate more pressure and manage the game better (Budhrani et al., 2024).

Even though the importance of controlling bowling length is acknowledged, there is still a significant gap in understanding the biomechanical factors that affect this skill, especially for wrist spin bowlers. Most previous biomechanical research in cricket has focused on fast bowlers, mainly because of their higher injury rates and the ongoing interest in improving ball release speed (Glazier & Wheat, 2014; Ranson et al., 2009a). While these studies have offered useful insights into bowling mechanics, their results do not always apply to wrist spin bowling, which involves different movement mechanics and joint actions.

Additionally, much of the existing research has looked at elite adult players who have fully developed skills and physical abilities. There is relatively less focus on younger players, whose biomechanical traits and developmental needs might be quite different (Keylock et al., 2022; Stretch, 2014). Athletes under 25 are an important group for development, as their technical skills and physical abilities are still changing during this time. During this developmental phase, athletes continue refining movement consistency, kinetic chain coordination, and adaptive motor strategies required for high-level performance. Young bowlers often demonstrate greater movement variability and less stable coordination patterns compared with fully matured elite athletes. (Stretch, 2014). Identifying the biomechanical characteristics of this population is therefore essential for developing age-appropriate coaching interventions, optimizing performance development, and reducing the adoption of incorrect movement patterns.

In Sri Lanka, cricket has significant cultural and social value, with many world-class spin bowlers emerging from the country. However, even with strong participation at the grassroots level in places like Rathnapura District, not many players from this area have reached the national team. This gap shows the need for coaching methods based on scientific insights and objective biomechanical analysis to help develop talent.

Therefore, this study aims to explore the kinematic factors that affect good length bowling among under-25 wrist spin bowlers in Rathnapura District, Sri Lanka. Using three-dimensional motion capture technology, the research will measure joint movements and biomechanical aspects related to successful good length deliveries. The findings should offer evidence-based insights to improve coaching methods, enhance talent identification, and add to the scientific understanding of cricket biomechanics.

METHODS

Study Participants

Participants will be chosen from the under-25 age group, (age = 18.8 ± 1.7 years, height = 1.6 ± 0.1 m, weight = 64.5 ± 7.5 kg), ensuring they have experience of at least three years in the longer format of cricket to fit the study's context. All the participants actively competing in district-level cricket were free from any musculoskeletal injuries at the time of testing. The sample included five right-arm leg spin bowlers. All participants, and where appropriate, received a clear explanation of the study, including the risks and benefits of the participation, and were provided written informed consent before the participation. The research was approved by the Sabaragamuwa University Ethical Review Board.

Study Organization

This study used a quantitative, descriptive, and comparative research design to closely examine the kinematic factors that affect good length bowling among under-25 wrist spin bowlers in Sri Lanka's Rathnapura District. The Sports Biomechanics Laboratory, Faculty of Applied Sciences, Sabaragamuwa University of Sri Lanka, was used to collect kinematic data. The dimensions of the laboratory allowed each participant to use their normal full-length run-up and follow-through, while bowling on the equivalent of a standard-sized cricket pitch. All participants underwent a thorough warm-up before data collection. Following the warm-up and before the testing, twenty-one (14 mm) reflective markers were attached to participants' selected anatomical body landmarks. Marker placement procedures were conducted by the same investigator to maintain consistency across each participant.

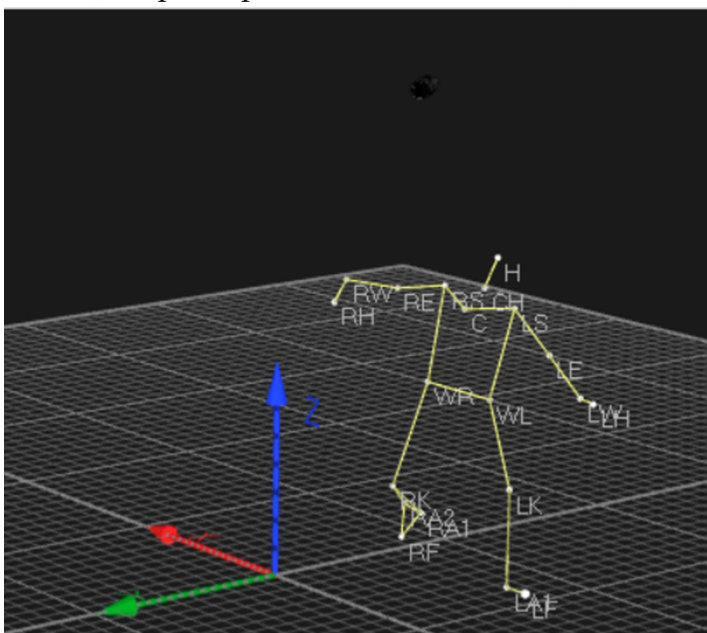


Figure 2. Marker Set-up

All the participants were given six warm-up deliveries. Each bowler then bowled four six-ball overs, split into two sets of two overs. All the participants were instructed to ball good length deliveries at match intensity. Bowlers used a self-selected rest period between each trail and following each set of twelve trails a five-minute rest period was given. All the bowlers used a red Super Caver cricket ball (156g).

Accuracy Data

The deliveries pitching within the good length area were considered as accurate deliveries, while the deliveries pitching outside of the good length area were considered as inaccurate deliveries. Accuracy data were recorded and marked down in the data sheet manually by three observers independently. The length of the ball pitched was decided by comparing three independent decisions made by the observers.

Kinematic Data

Qualisys six-camera (Miquis) motion capture system was operated at 100Hz to capture the kinematic data and was exported to Qualisys Track Manager 2025.2 for filtering and kinematic analysis. Key events in the bowling action (e.g., Back Foot Contact, Front Foot Contact, Ball Release) were

identified for temporal analysis. Joint angles were calculated by importing three-dimensional data into Microsoft Excel using the vector dot product method. At FFC, elbow angle (°), shoulder angle (°), knee angle (°), hip angle (°), wrist angle (°), and the height of the COG (m) was calculated. At BR, elbow angle (°), shoulder angle (°), knee angle (°), hip angle (°), wrist angle (°), and the height of the COG (m), release velocity (m/s), and release height (m) were calculated. At the FFC to BR phase, the peak angular velocity of the right wrist, right shoulder, right elbow, and right hip (°/s) was calculated (Ranson et al., 2009).

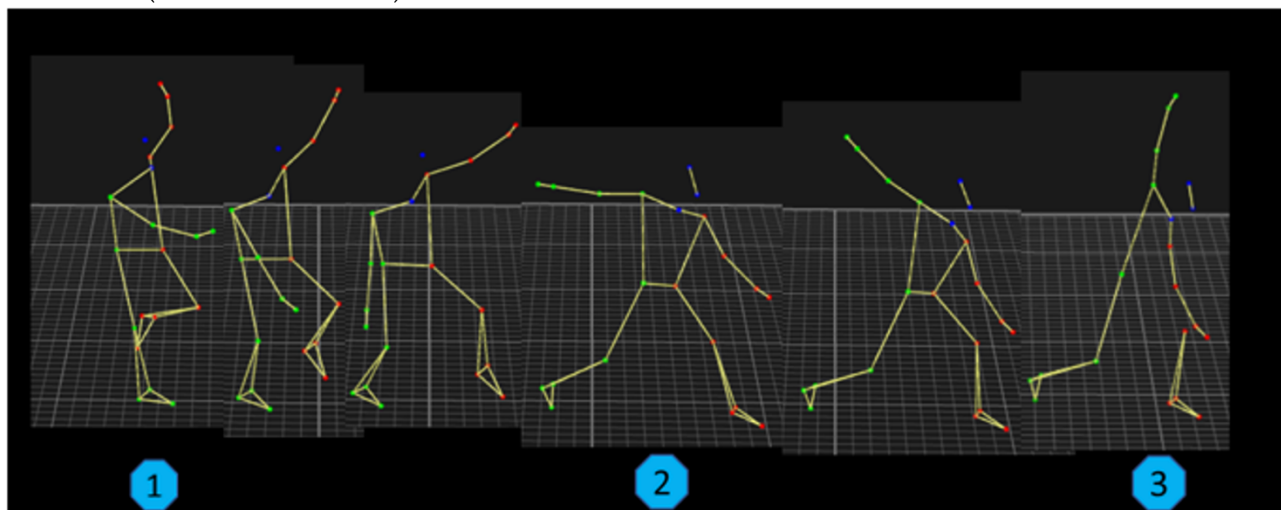


Figure 3. Movement pattern of the wrist spin

Figure 3 illustrates the biomechanical movement pattern of a wrist spin delivery, divided into three key phases: Back Foot Contact (BFC) as the back foot lands to initiate the delivery stride, Front Foot Contact (FFC) when the lead foot plants to provide stability and transfer energy, and Ball Release (BR) where the ball is released with the bowling arm fully extended overhead.

Data Processing

Labelling was conducted in Qualisys Track Manager 2025.2, whereby all trails were labelled, and approximately gaps filled. A biomechanical model was reconstructed and assigned to the marker trajectories of all bowling trails. Raw three-dimensional marker trajectory data were filtered using a fourth-order low-pass Butterworth filter with a cut-off frequency of 8 Hz to reduce high-frequency noise associated with marker vibration, soft tissue artefacts, and optical tracking variability during dynamic bowling movements. (Crenna et al., 2021; Ranson et al., 2009b).

Statistical Analysis

Descriptive statistics (mean $\pm$ standard deviation) were used to profile each measured parameter. Since the data were non-normally distributed, unequal group sizes, and repeated deliveries were obtained from a small number of bowlers, non-parametric statistical procedures were employed. To determine whether significant differences existed between good and non-good deliveries, the Mann-Whitney U test was employed. In addition to group comparisons, Spearman's rank-order correlation was performed to examine the association between kinematic variables and delivery outcome ($\alpha = 0.05$).

RESULT

A total of 96 deliveries were examined and classified as follows: Good-length deliveries ($n = 14$), non-good-length deliveries ($n = 82$).

Table 1. Descriptive Statistics of Kinematic Variables

Variable	Non-Good (n=82) Mean $\pm$ SD	Good (n=14) Mean $\pm$ SD
Peak Wrist Angular Velocity($^{\circ}$ /S)	839 $\pm$ 478	1024 $\pm$ 537
Peak Hip Angular Velocity($^{\circ}$ /S)	95 $\pm$ 18	97 $\pm$ 36
Peak Shoulder Angular Velocity($^{\circ}$ /S)	729 $\pm$ 74	715 $\pm$ 102
Release Velocity (m/s)	19 $\pm$ 1.4	19 $\pm$ 0.99
Wrist Angular Displacement ($^{\circ}$)	-19.5 $\pm$ 13	-27.1 $\pm$ 10.9
Release Height (m)	1.8 $\pm$ 0.1	1.8 $\pm$ 0.1
COG at BR (m)	0.8 $\pm$ 0.06	0.7 $\pm$ 0.1
Wrist Angle at BR ($^{\circ}$)	22.5 $\pm$ 10.3	23 $\pm$ 9.3
Wrist Angle at FFC ($^{\circ}$)	42.1 $\pm$ 17.2	50.2 $\pm$ 18.6

Table 1 above outlines the descriptive statistics (Mean $\pm$ SD) of the kinematic variables, comparing non-good-length deliveries (n=82) with good-length deliveries (n=14), showing notable baseline variations in parameters such as peak wrist angular velocity and wrist angular displacement.

Table 2. Mann-Whitney U Test Results

Variable	W	p-value
Peak Wrist Angular Velocity($^{\circ}$ /S)	139	0.26
Peak Hip Angular Velocity($^{\circ}$ /S)	172	0.70
Peak Shoulder Angular Velocity($^{\circ}$ /S)	196	0.88
Release Velocity (m/s)	178	0.81
Wrist Angular Displacement ($^{\circ}$)	284	0.03
Release Height (m)	245	0.20
COG at BR (m)	248	0.18
Wrist Angle at BR ($^{\circ}$)	198	0.84
Wrist Angle at FFC ($^{\circ}$)	122	0.13

Table 2 displays the Mann-Whitney U test results, revealing that among all measured kinematic variables, only wrist angular displacement demonstrates a statistically significant difference between the two delivery groups (W = 284, p = 0.03), with the remaining parameters showing no meaningful differences (p > 0.05).

Table 3. Spearman's Rank Correlation Test Results

Variable	rho	p-value
Peak Wrist Angular Velocity($^{\circ}$ /S)	0.15	0.26
Peak Hip Angular Velocity($^{\circ}$ /S)	0.05	0.70
Peak Shoulder Angular Velocity($^{\circ}$ /S)	-0.02	0.88
Release Velocity (m/s)	0.03	0.81
Wrist Angular Displacement ($^{\circ}$)	-0.28	0.03
Release Height (m)	-0.16	0.21
COG at BR (m)	-0.17	0.18
Wrist Angle at BR ($^{\circ}$)	-0.03	0.84
Wrist Angle at FFC ($^{\circ}$)	0.20	0.13

Table 3 illustrates the Spearman's rank correlation analysis, indicating that wrist angular displacement is the sole variable exhibiting a statistically significant, weak negative correlation with delivery length classification (ρ = -0.28, p = 0.03), whereas no other kinematic variables demonstrate significant correlations.

DISCUSSION

This study investigated the kinematic factors affecting good length bowling of under- 25 wrist spin bowlers in Rathnapura District. The primary finding was that wrist angular displacement of the bowling arm between FFC and BR was the only kinematic factor that significantly differentiated good-length deliveries from non-good-length deliveries. Furthermore, it indicates a moderate negative relationship ($\rho = -0.28$, $p = 0.030$), suggesting that increased wrist angular displacement is associated with a higher likelihood of producing good length deliveries. The negative values indicate that forward flexion of the wrist during the BR and it reduce the angle. Therefore, negative values primarily indicate the direction of the rotation, which represents the rotational movement of the wrist during the delivery phase, important for generating spin and controlling the length of the delivery.

Biomechanically, the wrist is the final segment of the bowling action before the BR. Wrist-spin bowling places particular emphasis on the control of the distal segment, as wrist positioning and articulation directly affect release mechanics, spin application and trajectory regulation (Ferdinands et al., 2023; Fuss et al., 2021). Increased angular displacement of the wrist in the acceleration phase may allow bowlers to achieve greater control of the spin axis orientation, release angle, and ball projection characteristics that collectively contribute to more accurate pitching lengths. Prior research has indicated the significance of wrist and finger mechanics in generating angular impulse and controlling spin characteristics in spin bowling (Ferdinands et al., 2023). Thus, the present findings offer preliminary evidence on the role of distal segment control in the accuracy of wrist-spin bowling.

The results should, however, be interpreted with careful consideration. One kinematic variable was statistically significant. Delivery outcomes were not significantly differentiated by proximal segment displacements, peak angular velocities, and release velocity. Therefore, the current study does not provide sufficient evidence to make strong conclusions regarding complete kinetic chain behavior, proximal to distal energy transfer, or coordinated segmental sequencing. Rather, the results more specifically suggest a segment-specific contribution of wrist articulation to accuracy of delivery under the present experimental conditions.

The present results are partially consistent with general biomechanical principles seen in throwing and striking sports where proximal body segments contribute more to force generation and stability, while distal segments contribute more directly to movement precision and fine motor control. Proximal-to-distal sequencing has been extensively reported in the biomechanics of overhead throwing, baseball pitching, tennis serving and cricket bowling (Elliott et al., 2007; Glazier & Wheat, 2014). However, in contrast to these investigations, the present study did not directly measure segmental timing, joint sequencing, or the transfer of energy between body segments. Thus, interpretations of kinetic chain coordination should be conservative and confined to the segmental relations observed.

The absence of significant differences in peak angular velocities and release velocity may also suggest that wrist-spin bowling accuracy is less dependent on maximal rotational speed and more dependent on controlled technical execution. This contrasts with fast bowling biomechanics where release velocity and ground reaction forces are strongly related to performance outcomes (Ranson et al., 2009a). Wrist-spin bowling seems to require more emphasis on controlled distal articulation and on consistency of release than on maximal force production. However, because only selected kinematic variables were studied in the current investigation, other biomechanical factors such as

spin rate, spin axis orientation, trunk mechanics and neuromuscular coordination may also significantly contribute to bowling accuracy and should be investigated in future studies.

An important limitation of the present study was the unequal distribution of delivery outcomes with only 14 deliveries classified as good length versus 82 non-good length deliveries. While proper non-parametric statistical methods were used to account for unequal group sizes and non-normal data distributions, the imbalance could have affected statistical sensitivity and reduced the ability to detect smaller biomechanical differences between groups. The low percentage of successful good length deliveries may also be a reflection of the inherent technical difficulty of consistently executing accurate wrist-spin bowling, particularly among developing bowlers under the age of 25. The findings are therefore to be interpreted as preliminary findings for this specific sample and not generalizable to all wrist spin bowlers.

Despite the limitations of the study, the findings have several practical implications for coaching and player development. Since wrist angular displacement was the only variable associated with delivery accuracy, coaches might prefer to place greater emphasis on wrist control, mobility and technical articulation during the acceleration phase of the bowling action. Training strategies that emphasize distal segment coordination, controlled wrist positioning and release mechanics can help wrist-spin bowlers improve bowling consistency. The findings, however, do not imply that mechanics of the proximal segment are unimportant. Proximal segments, therefore, may have a primary role in maintaining movement stability and in facilitating effective positioning for distal segment execution. Therefore, coaching interventions should not focus on maximal rotational speed but on the development of coordinated and repeatable movement patterns.

CONCLUSION

This study concludes that wrist angular displacement between front foot contact and ball release is the sole kinematic variable that significantly distinguishes and influences good length delivery accuracy among under 25 wrist spin bowlers in Rathnapura, Sri Lanka. These findings highlight the critical role of distal segment control, specifically wrist articulation, over proximal segments or release velocity, providing valuable insight for coaches to design training interventions focused on release mechanics and wrist technical consistency.

ACKNOWLEDGMENT

The authors thank all the academic staff of the Department of Sports Sciences and Physical Education, Faculty of Applied Sciences, Sabaragamuwa University of Sri Lanka. Appreciation is extended to Prof. A.W.S. Chandana, Department of Sports Sciences and Physical Education, Faculty of Applied Sciences, Sabaragamuwa University of Sri Lanka, for supervision.

CONFLICT OF INTEREST

The authors declare no conflict of interest regarding this research.

REFERENCES

- Budhrani, T., Khatri, A., Tarachandani, V., Khatri, T., & Khatri, M. (2024). Excellence in Cricket leveraging AI/ML and Automation. In *International Journal for Research in Applied Science & Engineering Technology (IJRASET)* (Vol. 12). www.ijraset.com
- Callaghan, S. J., Lockie, R. G., Andrews, W. A., Yu, W., Chipchase, R. F., & Nimphius, S. (2019). The effects of an eight over cricket bowling spell upon pace bowling biomechanics and performance within different

- delivery lengths. *Sports*, 7(9). <https://doi.org/10.3390/sports7090200>
- Connor, J. D., Renshaw, I., & Farrow, D. (2020). Defining cricket batting expertise from the perspective of elite coaches. In *PLoS ONE* (Vol. 15, Number 6). Public Library of Science. <https://doi.org/10.1371/journal.pone.0234802>
- Crenna, F., Rossi, G. B., & Berardengo, M. (2021). Filtering Biomechanical Signals in Movement Analysis. *Sensors* 2021, Vol. 21, Page 4580, 21(13), 4580. <https://doi.org/10.3390/S21134580>
- Elliott, B. C., Alderson, J. A., & Denver, E. R. (2007). System and modelling errors in motion analysis: Implications for the measurement of the elbow angle in cricket bowling. *Journal of Biomechanics*, 40(12), 2679–2685. <https://doi.org/10.1016/J.JBIOMECH.2006.12.012>
- Ferdinands, R. E. D., Doljin, B., & Fuss, F. K. (2023). Identification, Taxonomy and Performance Assessment of Type 1 and Type 2 Spin Bowling Deliveries with a Smart Cricket Ball. *Sensors*, 23(18). <https://doi.org/10.3390/s23188012>
- Fuss, F. K., Doljin, B., & Ferdinands, R. E. D. (2021). Mobile computing with a smart cricket ball: Discovery of novel performance parameters and their practical application to performance analysis, advanced profiling, talent identification and training interventions of spin bowlers. *Sensors*, 21(20). <https://doi.org/10.3390/s21206942>
- Fuss, F. K., Doljin, B., & Ferdinands, R. E. D. (2023). The Biomechanics of Converting Torque into Spin Rate in Spin Bowlers Analyzed with a Smart Cricket Ball. *Indian Journal of Orthopaedics*, 57(10), 1605–1612. <https://doi.org/10.1007/s43465-023-00943-1>
- Glazier, P. S., & Wheat, J. S. (2014). An integrated approach to the biomechanics and motor control of cricket fast bowling techniques. In *Sports Medicine* (Vol. 44, Number 1, pp. 25–36). <https://doi.org/10.1007/s40279-013-0098-x>
- Jamil, M., Kerruish, S., Mehta, S., Phatak, A., Memmert, D., & McRobert, A. (2023). Identifying which factors impact bowling and batting performances during the “death” phase of an innings in international men’s 50-over cricket. *International Journal of Performance Analysis in Sport*, 23(2), 111–124. <https://doi.org/10.1080/24748668.2023.2193030>
- Kerruish, S., McRobert, A., & Jamil, M. (2025). Leg Spin or Off Spin? Orthodox or Unorthodox? – An In-Depth Examination of Bowling–Batting Match-Ups and the Effectiveness of Spin Variations in International and Franchise T20 Cricket. *European Journal of Sport Science*, 25(5). <https://doi.org/10.1002/ejsc.12296>
- Keylock, L., Alway, P., Felton, P., McCaig, S., Brooke-Wavell, K., King, M., & Peirce, N. (2022). Lumbar bone stress injuries and risk factors in adolescent cricket fast bowlers. *Journal of Sports Sciences*, 40(12), 1336–1342. <https://doi.org/10.1080/02640414.2022.2080161>
- Majeed Bhat, A. (2017). *CONSTRUCTION OF BOWLING SKILL TEST IN CRICKET*. <https://www.researchgate.net/publication/315836364>
- Ranson, C., King, M., Burnett, A., Worthington, P., & Shine, K. (2009a). The effect of coaching intervention on elite fast bowling technique over a two year period. *Sports Biomechanics*, 8(4), 261–274. <https://doi.org/10.1080/14763140903469908>
- Ranson, C., King, M., Burnett, A., Worthington, P., & Shine, K. (2009b). The effect of coaching intervention on elite fast bowling technique over a two year period. *Sports Biomechanics*, 8(4), 261–274. <https://doi.org/10.1080/14763140903469908>;WGROU:STRING:PUBLICATION
- Singh, U., Ramachandran, A. K., Doma, K., & Connor, J. D. (2023). Exploring the influence of task and environmental constraints on batting and bowling performance in cricket: A systematic review. In *International Journal of Sports Science and Coaching* (Vol. 18, Number 6, pp. 2292–2305). SAGE Publications Inc. <https://doi.org/10.1177/17479541231181549>
- Stretch, R. (2014). Junior cricketers are not a smaller version of adult cricketers: A 5-year investigation of injuries in elite junior cricketers. *South African Journal of Sports Medicine*, 26(4), 123–127. <https://doi.org/10.7196/sajsm.543>
- Tissera, K., Orth, D., Huynh, M., & Benson, A. C. (2024). A coach’s perspective on augmented feedback (and technology) in cricket. *International Journal of Sports Science and Coaching*, 19(2), 562–572. <https://doi.org/10.1177/17479541231213540>

INFORMATION ABOUT THE AUTHORS

Mulkapuge Don Nipun Lakshan; nipunlakshaaan@gmail.com; <https://orcid.org/0009-0001-0311-4623>; Department of Sports Sciences and Physical Education; Faculty of Applied Sciences, Sabaragamuwa University of Sri Lanka.

Arangala Witharanalage Suraj Chandana; surajchandana@appsc.sab.ac.lk; <https://orcid.org/0000-0002-1706-8736>; Department of Sports Sciences and Physical Education; Faculty of Applied Sciences, Sabaragamuwa University of Sri Lanka.

Hembadura Dewna Randini Silva; randinidewna@gmail.com; <https://orcid.org/0009-0009-9329-8611>; Department of Sports Sciences and Physical Education; Faculty of Applied Sciences, Sabaragamuwa University of Sri Lanka

CITE THIS ARTICLE AS

Lakshan, M. D. N., Chandana, A. W. S., & Silva, H. D. R. (2026). Kinematic Factors Affecting Good Length Bowling of Under-25 Wrist Spin Bowlers in Rathnapura District. *JSES : Journal of Sport and Exercise Science*, 9(2), 100-108. <https://doi.org/10.26740/jses.v9n2.p100-108>