

BIOCHEMICAL ANALYSIS OF THE BALL RELEASE (BOWLING) WITH FEMALE COMPETITORS IN CRICKET

Preliminary communication

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Abstract

The basic thing at training and improving the technical skills in the sport of cricket is the throwing of the ball (bowling), which has its specifics and crucial role for achieving success during matches. The bowling for women in the sport of cricket requires in female competitors technical skills, as well as good physical, tactical, and psychological training. The purpose of the survey held is to identify errors occurred in the implementation of the technical element of bowling (throwing the ball) among the leading players of the national women cricket team of Bulgaria. Captured are 8 (eight) leading cricketers who played in the position of bowler at the Balkan Championship for Women in 2014 while implementing the technical element of bowling. The mistakes made by the bowlers in the survey are in most cases due to the fact that they have started training in the sport of cricket about one year ago and have previously practiced other sports, from which some motor habits have resided, impeding the full implementation of this technical element.

Keywords: women, female competitors, biomechanical characteristics, phases of movement, psychological training, temporal characteristics of the movement, Coefficient of variation

INTRODUCTION

At evaluating the technique of ball release (bowling) in sports activity, we are guided by its efficiency during game, as expressed in performance accuracy, and, in the same time – maximal flight speed of the ball.

The proper bowling, especially among women, is adjusted individually according to their skills and even with a unified methodology of training each competitor builds up their own movements.

The effectiveness of the technique lies in its degree of proximity to the most rational technical option for a player and their individual capabilities.

According to their individual capabilities the competitors are profiled, as some of them are good with fast balls – the so called “fast bowlers”, and the rest throw spin balls – spin bowlers, or spinners.

In both ball releases the execution is characterized with peculiarities and specifics of its own, subjected to the ultimate goal in bowling:

To allow a minimum count of points for the opposing batsmen and realize the maximum possible number of outs. The overall performance is presented in Figure 1, also presenting the different phases that characterize it.

Bowlers' throwing is characterized by three phases – run-up, ball release, and closer.

Run-up is *the first phase* preceding the ball release, and its purpose is to use the acceleration from a few meters to

30 meters, to give extra strength and reach maximum speed in the flight of the ball.

The second phase involves the technical implementation of the shooting and on it depends the accuracy of the performance and the speed with which the ball may be passed to the opponent: from 50 to 160 km / h.

The final stage is a follow-up after the ball is released from the hand and preparation of the bowler to move towards fielding – readiness to catch the hit ball, to defend themselves, or get included in the defensive activities of the team.

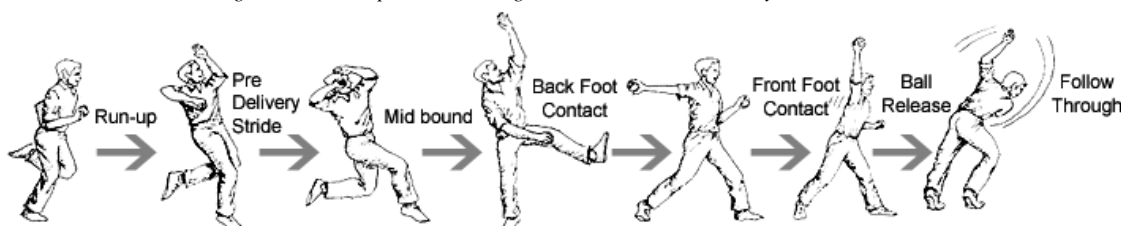
The second phase in bowling is then also characterized by three moments:

1. Stepping on the supporting leg and starting position of the throwing hand, to a subsequent transition to bowling.
2. Transferring the weight on the front leg.
3. The moment of ball release from the bowling hand.

This phase of the bowling might be called virtual, and at tracking the movement we see the participation in it of the entire body of the competitor.

The requirement to each bowler is to implement the movement with extended arm, as contraction in the elbow is not allowed.

Fig. 1. The second phase in bowling is then also characterized by three moments:



Nevertheless, any amount of knowledge about the general training of athletes will be provided largely pointless if the most important detail is isolated – the one preceding the start of each sports activity, aiming to achieve greatness in sport – the selection of the proper athletes for each specific sports discipline (Kolev, Ivan, 2012).

The purpose of the survey held is to identify errors occurred in the implementation of the technical element of bowling (throwing the ball) among the leading players of the national women cricket team of Bulgaria.

METHODOLOGY

Captured are 8 (eight) leading cricketers who played in the position of bowler at the Balkan Championship for Women in 2014 while implementing the technical element of bowling.

For reporting the physical activity a standard video camera was used and the so received video files were processed with a computer video analysis program, which allows to register vertically and horizontally selected points in space and the body of athletes during bowling. The spatial – temporal characteristics of the movement in this position were reported and investigated.

RESULTS AND DISCUSSION

Biomechanical Analysis of Bowling

Figures 2 and 3 below show the characteristic moments of bowling of two of the leading competitors.

We take into consideration the following designated points: Point 1 – wrist, point 2 – elbow, point 3 – shoulder, point 4

– pelvis, and the synchronization of those leads to maximum efficiency of the movement.

Figure 2 shows the movement of a competitor which as performance comes close to the standard accepted proper movement. Figure 3 shows the implementation of a bowling, which is typical for the majority of the female players in the Bulgarian National Team at the position of bowler.

Four moments are determined from the temporal characteristics captured for the competitors (Table 1). The first one, t_1 , is the zero and starts from the last preparatory step preceding the placement of arms in starting position. Then comes t_2 when the arms are in starting position, as the one is directed upwards, and the other is either before the chest or pointing downwards. Follows the implementation of the final step and swing with the hand that throws the ball. The t_3 moment is when the leg is placed forward, and it precedes the bowling. The t_4 moment is when the ball is released from the hand. Thus these 4 moments determine three intervals. The additional interval in the beginning which I added is in order not to miss anything important from the measurement of the temporal characteristics. The table shows the results of the different participants.

In Table 2 are calculated the variable characteristics of the competitors.

The coefficient of variation determines whether the distribution is normal and can be compared for growth to the Student Criterion. In this case, the fact it is up to about 30% allows the claim thereof. The same thing show the low values (up to 2) of the asymmetry and kurtosis.



Fig. 2. Movement of a competitor which as performance comes close to the standard accepted proper movement



Fig. 3. Implementation of a bowling, which is typical for the majority of the female players in the Bulgarian National Team at the position of bowler

Table 1. Temporal characteristics of the movement

Temporal Characteristics	t1	t2	t3	t4	t2-t1	t3-t2	t4-t3
6096	0	0,200	0,367	0,567	0,200	0,167	0,200
6097	0	0,167	0,430	0,567	0,167	0,263	0,137
6098	0	0,167	0,400	0,567	0,167	0,233	0,167
6100	0	0,367	0,500	0,667	0,367	0,133	0,167
6101	0	0,230	0,467	0,667	0,230	0,237	0,200
6102	0	0,300	0,430	0,630	0,300	0,130	0,200
6103	0	0,230	0,530	0,630	0,230	0,300	0,100
6104	0	0,200	0,500	0,667	0,200	0,300	0,167
6105	0	0,367	0,530	0,667	0,367	0,163	0,137
6106	0	0,367	0,530	0,667	0,367	0,163	0,137
6107	0	0,367	0,567	0,630	0,367	0,200	0,063
6108	0	0,367	0,500	0,630	0,367	0,133	0,130
6109	0	0,167	0,400	0,567	0,167	0,233	0,167
6110	0	0,200	0,400	0,600	0,200	0,200	0,200
6111	0	0,200	0,400	0,567	0,200	0,200	0,167
6112	0	0,200	0,400	0,567	0,200	0,200	0,167
6121	0	0,267	0,530	0,767	0,267	0,263	0,237
6122	0	0,367	0,567	0,800	0,367	0,200	0,233
6123	0	0,330	0,567	0,800	0,330	0,237	0,233
6124	0	0,300	0,567	0,800	0,300	0,267	0,233
6125	0	0,230	0,500	0,767	0,230	0,270	0,267
6128	0	0,230	0,530	0,700	0,230	0,300	0,170
6129	0	0,230	0,567	0,700	0,230	0,337	0,133
6130	0	0,267	0,567	0,700	0,267	0,300	0,133
6131	0	0,133	0,400	0,530	0,133	0,267	0,130
6132	0	0,230	0,500	0,630	0,230	0,270	0,130

Table 2. Variable characteristics of the competitors.

Mean Arithmetic [S]	X	0,257	0,229	0,169
Mean Quadratic	S	0,075	0,058	0,048
Coefficient of Variation	V	29%	25%	28%
Asymmetry	As	0,346	-0,167	0,081
Excess	Ex	-1,187	-0,907	-0,128
Maximal Value [S]	Max	0,367	0,337	0,267
Minimal Value [S]	Min	0,133	0,130	0,063
Range – Difference between them [S]	R	0,234	0,207	0,204

CONCLUSION

The shooting made allows us to make the conclusions as follow:

Essential errors in the implementation technique of the bowlers' throwing are seen among women, both in the starting and the closing phase.

The mistakes made by the bowlers in the survey are in most cases due to the fact that they have started training in the sport of cricket about one year ago and have previously practiced other sports, from which some motor habits have resided, impeding the full implementation of this technical element.

The creation of a methodology for training, consistent to the level of development and promotion of the sport in the Republic of Bulgaria and the countries of the region, will increase both the accuracy and the power of implementation.

The preparation of girls and women and their involvement in competitions from early age is a prerequisite for the acquiring of proper technique and better results in bowling (ball release).

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