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BIOMECHANICAL ANALYSIS OF CRICKET BATTING OF BKSP CRICKETERS

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ABSTRACT

The purpose of this study was to analyze the batting skill of Bangladesh Krira Shikkha Protisthan (BKSP) cricketers. For the purpose of this study 4 cricketers were selected from BKSP. They were undergo for long term training programme in the institution. A high configure camcorder was used to collect videographical data. The camcorder was placed at 10 meters away from movement execution zone. The batsmen were asked to performed batting movement (including Gripping, Stance, Backlift, Front foot defence, Backfoot defence etc.). Their movement were captured in the camcorder. After collecting video footage by camcorder, it was downoaded to personal computer. The data was analysed by Kenovia 8.0 Motion analysis software. Several statistical value were computed by SPSS-16. The results of the study documented that Jaker was one of the best bastsmen among the selected four cricketers of BKSP.
Keywords: *Biomechanical, cricket, batting, gripping, stance, backlift.*

1. INTRODUCTION

Recently, video graphic technique has begun to replace conventional cinematographic technique for motion analysis. With all these advantages video graphic technique is very appropriate for training, coaching and qualitative analysis (Elliott, Baker, & Foster, 1993). But it is not generally suitable for research of a quantitative nature. The image on the video recorder is formed by an electron beam impinging upon a fluorescent screen. The beam scans the face of

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the cathode ray tube at a rate of 30 fps. While the videotape is acceptable for viewing purpose, it is not of sufficient resolution and linearity to permit fine measurement. In addition, the image tends to deteriorate if the types are tored for extended period of time.

In the sport of cricket, batting is the act or skill of hitting the cricket ball with a cricket bat to score runs or prevent the loss of one's wicket. The invention of the bowling machine has evoked a new paradigm of research in cricket science. Primarily bowling machine is used by batsmen to improve their batting technique (Gibson, & Adams, 1989; Renshaw, & Fairweather, 2000; Muller, Abernethy, & Farrow, 2006; Dutt-Mazumder, 2010). Biomechanists to think more about how they may assist coaches to enhance the player development pathway. A player who is currently batting is denoted as a batsman, while the act of hitting the ball is called a shot or stroke (Stretch, 1993). The term specialist batsman are also used generically to describe players who specialize in batting (as opposed to e.g. bowlers who specialize in bowling), and the term batsman is also used in this context (Abernethy, 1981; Abernethy, & Russell, 1984). The latter term can, however, refer to any player during their turn at bat. In women's cricket, the term batswoman is sometimes encountered, as is batter, but the 'male' form is widely used in both men's and women's cricket.

The review of literature showed that there is lot of researchers who worked on cricket batting skill few of them are like… Lockie, Callaghan, and Jeffriess, (2013) they analyzed the specific speed testing for cricketers. McKellar, Nurick, and Stretch, (1998) measured the position of a ball striking a cricket bat. Muller, and Abernethy, (2006) worked on the batting skill with occluded vision and try to seek out when a high and low skilled batsmen pickup and interceptive the ball in different game situation. Portus, Timms, Spratford, Morrison, and Crowther, (2010) develop a batting skills test to assist the development of elite cricketers. Portus, and Farrow, (2011) tries to find out the ways for enhancing cricket batting skill with the implications for biomechanics and skill acquisition research and practice. Stretch, Bartlett, and Davids, (2000) reviewed the batting in men's cricket. Stretch, Buys, and Viljoen, (1995) investigated the kinetics of the drive off the front foot in cricket batting with different hand grip forces. Stretch, Buys, DuToit, and Viljoen, (1998) this time they worked on the kinetics as well as kinematics of the drive off the front foot in cricket batting. Stuelcken, Portus, and Mason, (2005) analyse the off-side front foot drives in men's high performance cricket. Taliep, Galal, and Vaughan, (2007) researched the position of the head and centre of mass during the front foot off-drive in skilled and less-skilled cricket batsmen. Weissensteiner, Abernethy, and Farrow, (2011) worked on what are the components of the interceptive action are most linked to expertise while hitting a cricket ball. Weissensteiner, Abernethy, Farrow, and Muller, (2008) done a crosssectional examination of the practice experiences contributing to skill in

cricket batting. Usually the trainers and coaches perform this analysis to observe the performance of their students and describe the mechanical characteristics of the performance (Woolmer, Noakes, & Moffett, 2008). The sense of visual observation is the basis of most of the qualitative analyses (Sarpeshkar, & Mann, 2011). Comparative descriptors (faster, slower, higher, lower, shorter, longer, and larger) may be used to describe the characteristics. The approach may be different depending upon the goal of analysis; the general scheme of qualitative biomechanical involves four steps i.e. preparation, observation, evaluation, and intervention. The objective of this study is to model a well balanced and scientifically authentic model test for batting skill and to measure the possibilities of the young cricketers of BKSP to become international superstar. The study itself reflects on the basic concept of batting and traditional batting techniques with the drills related to the game. It covers almost every part of batters movements and the execution abilities in the indoor nets and in the outdoor real time match practice. Moreover, it is designed to indicate the basic problems and execution errors of promising young cricketers of BKSP.

2. METHODS AND MATERIALS

2.1 Study Design and Area

The study is based on the particular four (04) batsmen of Bangladesh Krira Shikhkha Protisthan (BKSP). The concerned points of analyses were: grip position (without gloves), grip position (with gloves), side on view of grip and position, backlift, stance (with gloves), stance (without gloves), forward defence in match condition, straight drive in match condition and off-drive in match condition. The performance of the subjects was evaluated by international standard and according to the rules and regulations of ICC and MCC.

2.2 Subjects

The subjects selected for this study were total 04 batsmen (cricketers) from Bangladesh Institute of Sports, Bangladesh Krira Shikhkha Protisthan, Zirani, Savar, Dhaka who had participated in national level competitions. It was to be noted that the entire batsman were right handed. The ages of the subjects were quite similar to each other.

2.3 Procedure of Data Collection

The existing scientific and pedagogic literature related to the area of the study was refined and the proper tests for quantifying the selected parameter of batting skills

of the batsmen were selected for the investigation of the study. The data for different variables of the batsmen were collected by manipulating a biomechanical film with the help of a camcorder working with 60 frames per seconds using standard videographic configuration. After a specific warm-up subjects were asked to execute movements. Each batting skill was repeated three times. Their movements during the execution were recorded in the camcorder. After recording all the video footages were downloaded into personal computer and subjected to biomechanical analysis.

2.4 Data Analysis

Data on the above mentioned variables were digitized through motion analysis software (Kinovea). The frames of movements required were frozen and stored in an optical disc, which was further transferred to a computer, and these frames of movements were analyzed through motion analysis software (Kinovea version 0.8.15) and desired biomechanical parameters were calculated.

2.5 Statistical Analysis

To measure the particular batsman ranking the help of statistics was taken and deviation, percentage error was also calculated. In the end SPSS (v.16) software was used to determine overall ranking and the batsman quality. The batting skills were taken for the analyses were given at the following:

3. RESULTS

Table 1: Ranking of all batsmen regarding all the parameters

Cricketer's Name	GP (WOG)	GP (WG)	SVGP	B	S (WOG)	S (WG)	FDMC	SDMC	ODMC	Total Score	Overall Ranking
Rabbi	3	1	4	3	1	1	4	1	3	21	3rd
Jaker	4	4	2	2	4	4	1	4	2	27	1st
Arham	1	2	1	1	2	2	2	2	4	17	4th
Mahbub	2	3	3	4	3	3	3	3	1	25	2nd

Abbreviations: GP (WOG)= Grip Position (Without Gloves), GP (WG)= Grip Position (With Grip), SVGP= Side On View of Grip and Position, B= Backlift, S (WG)= Stance (With Gloves), S (WOG)= Stance (Without Gloves), FDMC= Forward Defence in Match Condition, SDMC= Straight Drive in Match Condition, ODMC= Off Drive in Match Condition.

Table 2: Descriptive analysis of the data

Cricketer's Name	Total Score	Mean	SD	Skewness
Md. Shahnewaz Ahmed Rabbi	21	2.33	1.32	0.046
Jaker Ali	27	3.00	1.22	-0.524
Md. Arham Hossain	17	1.89	0.92	1.469
Md. Mahbub Hasan	25	2.78	0.83	-1.169

Various types of results were achieved and the batsmen qualitative and quantitative observations were compared between international players. Therefore, the particular batsmen were ranked by their abilities and attributes. Some statistical parameters were also discussed to determine their overall condition and standard. The statistical parameters were analyzed by data handling and analysis software (SPSS v.16). Overall data was represented in some graphical presentation and in bar and result was given in a tabular form.

4. DISCUSSION

In the game of cricket there is always a chance to improve and room to do better. However, Batting is an artistic application where you must have elegance and perfect finish (Woolmer, Noakes, & Moffett, 2008). By the way the certain measures they could take by themselves or their mentors could do in the future are given at the following: At first Arham needs to be more stable and flexible in the crease, as it seems in the analysis he was stuck on the crease. He should relax his all joints, muscles and nervous systems. He could do more flexibility exercises and a lot of strength exercises around the hips and lower part of the bodies. In the second concern Rabbi was a good player but he needs to be more focused in the crease. He possesses a good head, feet and body position. However he should do more reaction drills and reflex practices. Neuromuscular improvement must be done to increase his potential (Sarpeshkar, & Mann, 2011). At third notation Mahbub was fund a better player. He bears good head and his shoulder position and posture was satisfactory. Therefore, he needs to increase his power in shot making by drilling more in the nets. One concerned point is that he needs to develop his major working muscles by doing proper strength training. Strong shoulder muscles, abs and balanced quadriceps, hamstrings and proper use of strength in matches should be his prime concern. At the final and fourth concern cricketer is Jaker as he secured the 1st position in the analysis. He was undoubtedly the best among the other players. He has all the credentials to be a national player in the years to come. The things he should do now are to determine his strong and weak points. Sometimes it is good for a player to know

his limitations. Jaker must concentrate on the Backlift techniques especially the height and line of this drill must be determined quantitatively (Stretch, Buys, & Viljoen, 1995; Stretch, Bartlett, & Davids, 2000). He has the tendency to fall over in the reverse side while playing a shot. He should do more match practice and net practice along with the help of bowling machine.

5. CONCLUSIONS

The particular 04 players were taken in the research work were quite well organized and reputed by their playing abilities in BKSP. It should be noted that the ranking derived in the study is not the final words for them. As they were getting same training and environment facility provide by BKSP, all the determining factor were very closely each other. Thus within the limit and limitation of the study it is concluded that overall batting pattern of Jakir was found better than others.

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