



Effect of Throwers Ten Program on Performance in Fast Bowlers “Randomized Control Trail”

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Abstract

Background: Fast bowlers are considered some of the most influential players on the cricket field. Bowling in cricket involves an initial run-up, numerous rotations and circumduction of a straight arm about the glenohumeral joint to propel a ball at a batsman. Major contributor to high level fast bowling performance is the velocity at which a bowler can deliver the ball. Fast bowlers have a high risk of Injuries which may be caused by a number of factors, such as postural defects, poor bowling technique as well as high physical demands.

Aim: To evaluate the effectiveness of throwers ten program on performance in fast bowlers.

Objectives: To find out the effect of throwers ten program on speed and accuracy by using Tacho meter and coin test in fast bowlers.

Methodology: 48 subjects were approached in which 30 participants were selected according to inclusion and exclusion criteria and consent were taken. Each of 15 participants were divided in Group A (Experimental group) and Group B (Control group). Throwers ten program was given to experimental group and control group was told to follow their regular activity. Pre and post evaluation was done. 5 sessions for 3 week protocol was admitted.

Results: Experimental group showed significant improvement in speed and accuracy calculated from Tacho meter and coin test was 200.8 rpm to 219.8 rpm and 16.8cm to 8.6cm respectively as compared to the control group in which there is no improvement seen in arm speed and accuracy 198.4rpm to 197rpm and 18.4cm to 17.6cm respectively.

Conclusion: In this study we concluded that Throwers ten program improves performance in fast bowlers.

Keywords: Arm Speed, Accuracy, Fast Bowlers, Throwers Ten Program.

Introduction

Bowlers are some of the most common players on cricket field. Bowling in cricket involves an initial run-up, numerous rotations and circumduction of a straight arm about the glenohumeral joint to

propel a ball at a batter. The velocity at which a bowler can deliver the ball contributor to high level fast bowling performance. However, there is limited scientific information on the characteristics which relate to fast bowling ball

speed.⁽¹⁾ fast bowlers are important asset in professional cricket team. With only around six in a squad, keeping them available to train and play is critical to winning games. Fast bowlers have a high risk of Injuries which may be caused by a number of factors, such as postural defects, poor bowling technique, as well as high physical demands.⁽²⁾ During a match many bowlers are placed to field in the outfield and thus have a tendency to develop ‘thrower's arm’ and other injuries. Fast bowlers with a front-on bowling action are more susceptible to an injury of the shoulder.⁽³⁾ The bowling action comprises of a short phase of acceleration, followed by a bound, a landing and a launch – think of a javelin throwers. However, unlike Javelin this unhealthy, stressful movement is repeated numerous times, over months, days and hours.⁽⁵⁾ During bowling in cricket, the internal shoulder rotators are involved in the acceleration phase of the arm through concentric contractions, while the external rotators are involved during the deceleration phase. The nature of fast bowling requires the arm to be rotated at around 60000/second placing great demands on the shoulder's integrity.

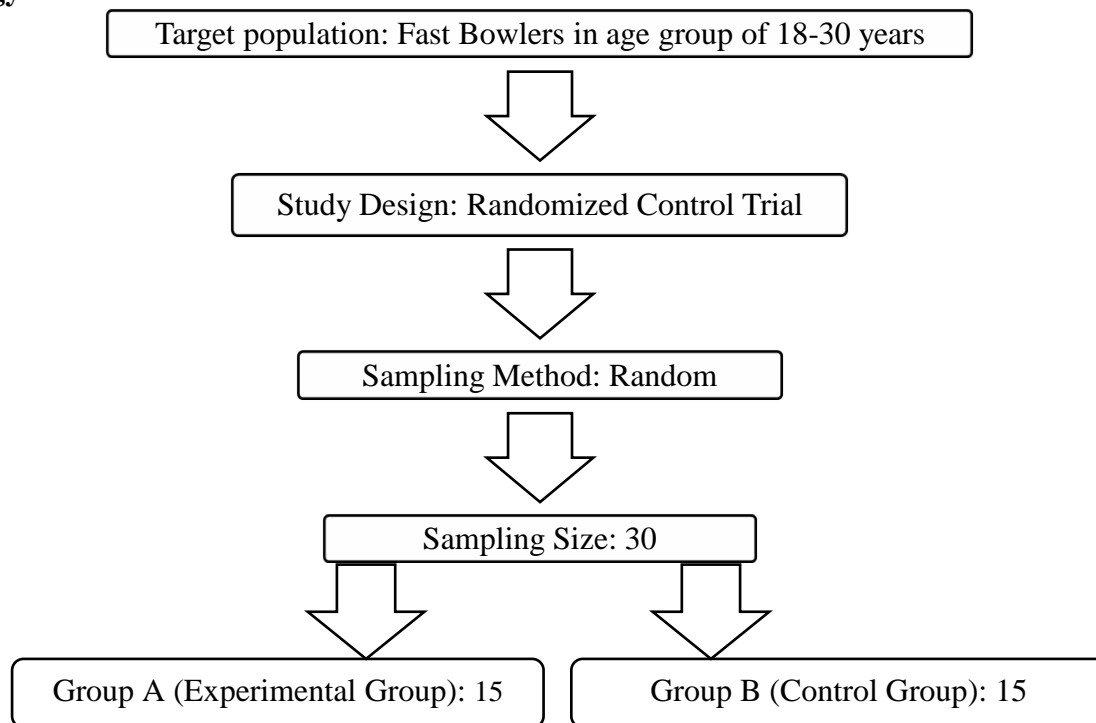
In add it onto the technical skills required to perform, cricketers also need to possess a high level of fitness, thus making them susceptible to overuse injuries as a result of repetitive training.^(6,7) The presence of an imbalance between the agonist and antagonist groups is one of the major risk factors for developing shoulder injuries such as dislocation and impingement with deficiency in the external rotator strength possibly resulting in an injury. Thus, the aim of the study was to investigate the relationship between shoulder flexibility and isokinetic strength as possible factors predisposing a male provincial fast bowler to shoulder injuries. The findings would assist in a better understanding of the risk factors for shoulder injury in an elite fast bowler, thus suggesting methods for reducing the incidence of injury and contributing to a prolonged career with fewer shoulder problems.⁽⁸⁾ Overuse injuries are generally the result of

repetitive micro trauma where a number of forces, each lower than the critical limit of the specific tissue, combine to produce a fatigue effect over time. The developing musculoskeletal system is particularly vulnerable to overuse, with sites of vigorous development in long bones and musculotendinous attachments being areas of potential injury.⁽⁹⁾ Participants who do repetitive activities which involve hyperextension of lumbar spine (fast bowling), may experience low back pain as there is fast growth of the vertebral bodies which do not match the dorsal soft tissue.^(8,9) The increased elasticity of the intervertebral disc which may allow a greater proportion of torsional forces to reach the vertebrae, incomplete ossification of the posterior vertebral elements until about 25 years of age, and incomplete formation of the iliolumbar ligament (which may be a very important stabilizer of the lumbosacral junction) until the third decade of life span each increase the propensity of junior athletes to injury.⁽¹⁰⁾ The most serious overuse injuries for young fast bowlers are those to the pars inter articularis, as they can potentially limit participation in the game for extended periods.⁽¹¹⁾ Thrower's Ten Program was designed by Kevin E. Wilk (2011) to exercise the major muscles necessary for throwing. The exercises included are specific to the thrower and are designed to improve strength, power and endurance of the musculature of the shoulder complex. This protocol has been found to improve the performance in tennis, javelin and badminton. Myers et al (2005) suggested that exercises used in Thrower's Ten Program are most effective in activating the scapular retractor muscle and may be beneficial for athlete's pre throwing warm-up routine. Throwers Ten Program was effective on improvement of retractor muscle strength, joint position error, throwing distance and throwing accuracy in recreational overhead activities.⁽¹²⁾ A tachometer is a device that measures the angular speed of a rotating shaft in revolution per minute. A good example of a device that can be measure with a tachometer is a moving fan. Also some

tachometer can measure the linear speed in term of feet per minute or meter per minute. An

example of a linear surface speed measurement.⁽¹²⁾⁽¹⁵⁾

Methodology



Permission was taken from the institutional ethical committee of Tilak Maharashtra Vidyapeeth department of physiotherapy. Subjects were approached for data collection from cricket sport club in & around pune city. In which 30 Participants was selected according to the inclusion and exclusion criteria. Two groups were made of 15 participants in each group. The aim and method of the study was explained and their informed consent was taken. Demographic data sheet was filled by participants. Tacho meter is device which measures arm speed. Tacho meter will be held in bowling hand of the fast bowler and the bowlers will be explained to rotate arm like they do while delivering the ball. Best of 3 reading was recorded. The coin test was done to check the accuracy of bowlers in cricket. The coin was placed at mid-point at good length region which is 5m away from batman-end in 22 yard pitch on and the bowlers are told to try and bowl on the coin. The measurement was taken from the first impact of ball where is pithed till the coin. Best of 3 readings was taken. Group A (experimental) was given throwers ten program

exercises with active movements and group B was given only active movements. The Experimental group will receive Thrower's Ten Program as per the standardized protocol by Kevin E. Wilk. In this study, 6 exercises were included such as D2 PNF flexion and extension, IR and ER, push up and press ups .In shoulder internal and external rotation thera band was secured to the stable base at a height equal to the height of each subject's elbow from the ground when standing position, (D2) extension the Level 1 thera tubes was secured at a height equal to the height of each subject's fingertips touch the bar (wall) in full shoulder flexion.

Protocol

(10 repetition/twice a day for 3 weeks)

- D2 PNF flexion
- D2 PNF extension
- Internal rotation
- External rotation
- Push ups
- Press ups

Data Analysis: The data was analyzed by using Graph Pad I stat 3.0 version. Mean and Standard deviation were found out as well paired “t” and “p” values were applied to find out the relationship between pre and post values for speed and accuracy.

improvement in speed and accuracy calculated from Tacho meter and coin test was 200.8 rpm to 219.8 rpm and 16.8cm to 8.6cm respectively as compared to the Group B (Control) group in which there is no improvement seen in arm speed and accuracy 198.4rpm to 197rpm and 18.4cm to 17.6cm.

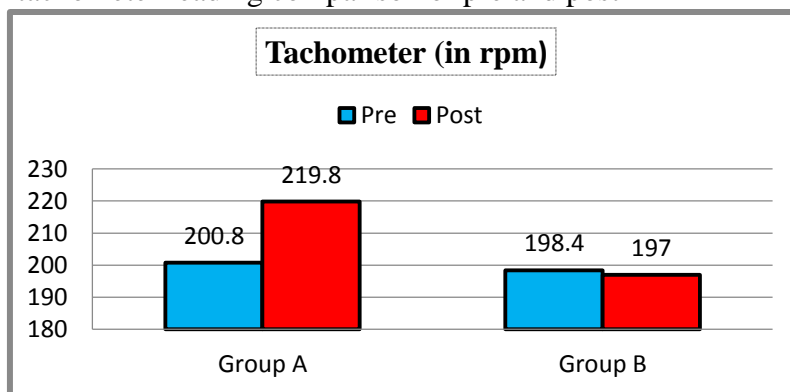
Results

Between two group comparisons was done Group A is (Experimental) group showed significant

Table No. 1: Result of tachometer pre and post intervention

Tachometer (rpm)	Pre (mean±S.D.)	Post (mean±S.D.)	p-Value
Group A	200.8±14.36	219.8±17.3	0.0002
Group B	198.4±14.38	197±13.2	0.0542

Graph No. 1: Graph of tachometer reading comparison of pre and post

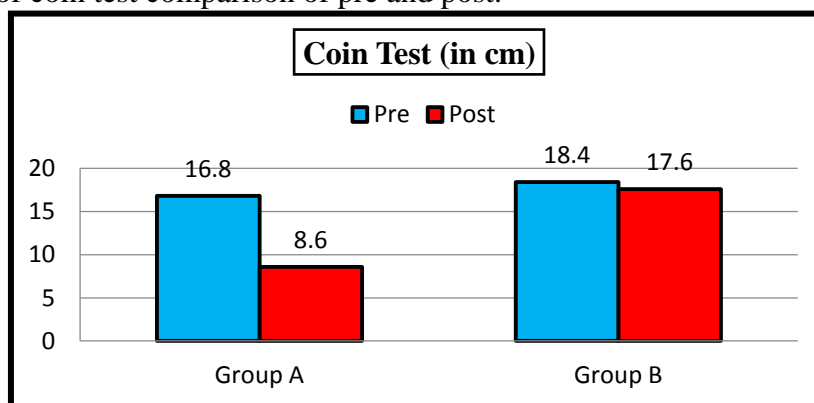


Interpretation: Group A showed significant improvement in coin test reading (p-value<0.0002) and Group B didn't show any improvement (p-value<0.0542).

Table No.2: Result of coin test pre and post intervention

Coin Test (cm)	Pre (mean±S.D.)	Post (mean±S.D.)	p-Value
Group A	16.8±6.56	8.6±6.7	0.0001
Group B	18.4±8.9	17.6±9.2	0.2379

Graph No. 2: Graph of coin test comparison of pre and post.



Interpretation: Group A showed significant improvement in coin test reading (p-value<0.0001) and Group B didn't show any improvement (p-value<0.2379).

Discussion

At the end of four weeks Experimental group showed significant improvement in speed and accuracy calculated from Tacho meter and coin test is 200.8 rpm to 219.8 rpm and 16.8cm to 8.6cm respectively as compared to the control group in which there is no improvement seen in arm speed and accuracy 198.4rpm to 197rpm and 18.4cm to 17.6cm respectively. In our protocol 6 exercises were included, which were D2 PNF flexion and extension, IR and ER, push up and press ups. The tube resistance band is used for D2 PNF exercises. Swanik et al suggested that rubber tubing resistance exercise will benefit all throwing athletes by improving strength, proprioception, muscle performance characteristics, and injury prevention.

The present study is conducted among 30 fast bowlers residing in pune. The aim of study is to find out the effectiveness of throwers ten programs on performance in fast bowlers. Players within age group of 18 to 30 years are assessed. There are all male fast bowlers taken as participants. 42 fast bowlers are approached out of that 30 fast bowlers are taken for further study. From the total number of 30 players, 2 groups are made by dividing 15 patients in each group A and B. After the assessment of bowlers group A is given throwers ten program which included 6 exercises which is done for 3 week of time span and the group B is told to follow their regular activity.

Later after 3 week the re-assessment is performed again on the same 30 bowlers to check the result.

At the end of three weeks, for experimental group showed significant improvement for tacho meter is from 200.8 rpm to 219.8 rpm and for control group there is no improvement 198.4 rpm to 197rpm. For coin test of experimental group showed extremely significant improvement is 16.8cm to 8.6cm and for control group there is no improvement 18.4cm to 17.6cm. In our program 6 exercises are added such as D2 PNF flexion, D2 extension, push up, press ups, IR and ER.

Thera band exercises permit concentric and eccentric of the shoulder muscles and area form of isotonic exercises. Restoration of dynamic stability to the GH joint through proprioceptive and neuromuscular training drills. Internal and external rotation rhythmic stabilization drills are done at various degrees of non-painful arm elevation. External rotation is strengthened with light isotonic and isometric.

Ujwal Yeole et al (2017) conducted a study to find effectiveness of thrower's ten program on performance of hammer throwers. Strength and power production is greatly reduced when an athlete which couldn't place the shoulder blades in a proper retracted position. So to achieve the necessary scapular positioning the normal function of the scapular retractor muscle is required. However, increased in strength in Intervention group could be because of increased neural response as has been shown after exercises regimen. Thrower's Ten Program is effective in improving performance of hammer throwers with increase in scapular retractor strength, throwing distance.

Conclusion

It is concluded that Throwers ten program improves performance in fast bowlers.

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