



## **MEDICINE BALL WITH RESISTANCE BAND EXERCISES – AN EXPERIMENTAL STUDY**

**Dr.K.Murugavel<sup>1</sup>, G.Prabakaran<sup>2</sup>, Dr.J.Nirendan<sup>3</sup>, N.Kodeeswaran<sup>4</sup>, K.Ooraniyan<sup>5</sup>  
N.Arjunan<sup>6</sup>, P.Udhaya Kumar<sup>7</sup>**

<sup>1</sup> Senior Professor and Head, Department of Physical Education, Bharathiar University, Coimbatore, Tamilnadu, India

<sup>3</sup> Guest Faculty, Department of Physical Education, Bharathiar University, Coimbatore, Tamilnadu, India

<sup>2,4,5,6,7</sup> Research Scholar, Department of Physical Education, Bharathiar University, Coimbatore, Tamilnadu, India

### **ABSTRACT**

*Cricket is often criticized for being a slow sport, especially in the case of five-day test matches, but do not underestimate the mental and physical endurance required to play the game at the highest level. Cricketers must be able to bolt into action from a standing start, and this is true whether they are batting, bowling, or fielding. In order to assess the real facts the investigator made an attempt to examine the impact of Medicine Ball Exercise with Resistance Band Exercises on Strength Parameters of Cricket Players were selected from Bharathiar university inter collegiate cricket players, in Coimbatore district. Their aged of the subject ranged from 21 to 23 years. Selected subjects was randomly assigned to two equal groups (n=15), group I underwent Medicine Ball Exercise with Resistance Band exercise (MBWRB) and group II acted as control group (CG). The Strength Parameters was given to the experimental group for 3days per week for the period of 8 weeks. The control group did not practice in any training except their routine work. The following variables were measured with standard test items: shoulder strength and grip strength. Pre and posttest was conducted on separate days with warm up. The shoulder strength measures by medicine ball in meters, grip strength measured by and grip dynamometer test. To find out the individual effect 't' test was applied at 0.05level of significant. Further, the findings confirmed the medicine ball with resistance band exercise is suitable protocol to bring out the desirable changes over the shoulder strength and grip strength of cricket players.*

**KEY WORD:** *Shoulder strength, Grip strength, Medicine Ball Exercise with Resistance Band Exercises and cricket players*

### **INTRODUCTION**

Cricket is a bat-and-ball sport contested by two teams, usually of eleven players each. A cricket match is played on a grass field, roughly oval in shape, in the centre of which is a flat strip of ground 22 yards (20.12m) long, called a pitch. At each end of the pitch is a construction of three parallel wooden stakes (known as stumps) driven vertically into the ground, with two small crosspieces (known as bails) laid across the top of them. This wooden structure is called a wicket.

The batsman, if he or she does not get out (for example if the bowled ball hits the wicket, or if a fielder catches the ball off the bat before it bounces), may run between the wickets, exchanging ends with a second batsman (the non-striker), who has been waiting near the bowler's wicket. Each completed exchange of ends scores one run, and the match is won by the team that scores more runs. Cricket has been an established team sport for hundreds of years. It originated in its modern form in England and is most popular in the present and former members of the Commonwealth. Cricket is the second most popular sport in the world. More than a hundred cricket-playing nations are recognized by the International Cricket Council. In the countries of South Asia, including India, Pakistan, Bangladesh and Sri Lanka, cricket is the most popular sport. It is also a major sport in England and Wales, Australia, New Zealand, South Africa, Zimbabwe and the English-speaking countries of the Caribbean, West Indies. There are also well-established amateur club competitions in countries as diverse as the Netherlands, Kenya, Nepal and Argentina, among others. The aim of the batting team is to score as many runs as possible. A run is scored when both batsman successfully moves to their respective opposite ends of the pitch [the is sometimes referred to as the term with multiple meaning]. The batsman will usually only attempt to score runs after the striker has hit



the ball, but this is not required by the rules- the batsman can attempt runs at any time after the ball has been bowled. Runs are also scored if the batsman propels the ball to the boundary of the playing area (scoring six runs if the ball crosses the boundary without having touched the ground or four runs otherwise), or if the bowler commits some technical infringement.

The aim of the bowler's team is to get each batsman out (this is a wicket, or a dismissal). Dismissals are achieved in a variety of ways. The most direct way is for the bowler to bowl the ball in such a way that it hits the stumps, dislodging the balls. While the batsmen are attempting a run, the fielders may attempt to dismiss either batsman by using the ball to knock the bails off the set of stumps to which the batsman is closest, before he has grounded himself or his bat in the crease. Other ways for the fielding side to dismiss a batsman include catching a struck ball before it touches the ground, or having the batsman adjudged LBW (leg before wicket, i.e., his body, which is prohibited). Once the batsmen are not attempting to score any more runs, the ball is "dead" and is bowled again (each attempt at bowling the ball is a ball or a delivery). The game is divided into overs of six (legal) balls. At the end of an over, the batting and bowling ends will be swapped, and the bowler replaced by another member of the fielding side. The two umpires also change positions at this time (the umpire previously at square-leg becomes the bowler's umpire at what is now the bowling end, and vice versa), and the fielding positions are rearranged.

Once out, a batsman is replaced by the next batsman in the team's line-up (The batting side can reorder their line-up at any time, but no batsman may bat twice in one innings.) The innings (singular) of the batting team ends when the tenth batsman is given out, since there always must be two batsmen on the field. When this happens, the team is said to be all out. (In limited overs cricket the innings ends either when the batting team is all out or a predetermined number of overs has been bowled.) At the end of an innings, the two teams exchange roles, the fielding team becoming the batting team and vice versa. A team's score is reported in terms of the number of runs scored and the number of batsmen that have been dismissed. For example, if five batsmen have been given out and the team has scored 224 runs, they are said to have scored 224 for the loss of 5 wickets (shortened to "224 for 5" and written 224/5 or, in Australia, "5 for 224" and 5/224).

The team that has scored more runs at the end of the completed match wins. Different varieties of the game have different definitions of "completion"; for instance there may be restrictions on the number of overs, the number of innings, and the number of balls in each innings. If the team that bats last has all of its batsmen dismissed before it can reach the run total of the opposing team, it is said to have lost by (n) runs (where (n) is the difference between the two run totals). If however, the team that bats last exceeds the opposing team's run total before its batsmen are dismissed, it is said to have won by (n) wickets, and where (n) is the difference between the number of wickets conceded and 10.

If, in a two-innings-a-side match, one team's combined first and second innings total fails to reach its opponent's first innings total, there is no need for the opposing team to bat again and it is said to have won by an innings and (n) runs, where (n) is the difference between the two team's totals. If all the batsmen of the team batting last are dismissed with the scores exactly equal then the match is a tie; ties are very rare in matches of two innings a side. In the traditional form of the game, if the time allotted for the match expires before either side can win, then the game is a draw.

Cricket is its own significance and while physical strength is important, fitness also focuses on increased flexibility, faster recovery from illness or injury, improved endurance, and much that has grown to the point where most people know that being physically fit doesn't just mean having a strong body it means being mentally fit too. Fitness helps an individual to control the body and mind and use it accordingly when required for their performance. Setting goals and maintaining it depends on how self-disciplined an individual is and how religiously one follows the fitness routine. The medicine ball slam is a great exercise to develop explosive power in the shoulders and lower abdominal. Stand with your feet shoulder width apart and knees slightly bent. Catch the rebounding ball and return to the start position. Advanced athletes can perform this exercise with one arm at a time. If the match has only a single innings per side, then a maximum number of deliveries for each innings is often imposed. Such a match is called a limited overs or one-day match, and the side scoring more runs wins regardless of the number of wickets lost, so that a draw cannot occur. If this kind of match is temporarily interrupted by bad weather, then a complex mathematical formula known as the Duckworth-Lewis method is often used to recalculate a new target score. A one-day match can be declared a No-Result if fewer than a previously agreed number of overs have been bowled by either team, in circumstances that make normal resumption of play impossible-for example, an extended period of bad weather. (SubhashK .Goyal, 1998)

## METHODOLOGY

Thirty physically active and interested university inter college cricket players were randomly selected as subjects and their age ranged between 21 and 23 years. The subjects are categorized into two groups namely control group (CG), medicine ball with Resistance band exercises (MBWRB) and each group had 30 subjects. The selected criterion variables shoulder strength endurance was assessed by push-ups in counts, grip strength measured by and grip dynamometer test. Medicine ball exercise with resistance band exercise group underwent the experimental treatment for 8 weeks, 3 days/ week and a session on each day with 45 min duration.



### MEDICINE BALL EXERCISES

Using a medicine ball adds a whole new dimension to your training since it takes you through all planes of motions (unlike traditional weight training). Warm-up exercise was performed in ground. After that the medicine ball exercises group performed the following exercises.

1. Mountain climbers,
2. Overhead squat.
3. Circles
4. Russian twist.
5. Side lunge
6. Pushups.
7. Single-leg deadlift.
8. Superman

### RESISTANCE BAND EXERCISES

Research shows that strength gains from using elastic resistance bands are similar to training with dumbbells or weight machines, benefiting not only the average person but also benefit athletes. Resistance band are likely best inexpensive training tool you can get whether you are a beginner or already at an advanced fitness level, resistance band exercise can give your muscles a good challenge.

1. Banded Single-Leg Tempo Deadlift
2. Deadlift
3. Lateral Raise
4. Lateral Squat To Cross-Body Row
5. Split-Stance Banded Shoulder Press
6. Standing Banded Triceps Extension
7. Banded Plank Tap

These exercises were performed for 45 min in a day and for 3 days/week. Pre and post test data were collected before and after 12 weeks of training. The collected data was analyzed using paired sample “t” test.

### TEST OF ADMINISTRATION

#### SHOULDER STRENGTH:

**Purpose:** To measure the explosive Strength of the shoulder.

**Equipment:**



Medicine ball of 3 kgs, measuring tape, marking powder.



**Procedure:**

Each subject was asked to stand with legs shoulder-width apart behind the marked line in the direction where they had to throw the ball. They were instructed to hold the ball with both hands and take that ball above the head, and when instructed to throw, they could bend their hands from the elbow to take that ball behind and throw the ball with maximum force in the forward direction. After releasing the ball, the subject was allowed to step forward from the restraining line to balance the body. For the administration of this test, the researcher needed two experts for measuring the distance of the medicine ball thrown by the subjects.

**Scoring:**

The distance from the starting line to where the ball landed was recorded in the nearest 0.1cm. The best of 3 throws was used for data analysis.

**GRIP STRENGTH**

**Purpose:** To measure grip strength

**Equipment:** Handgrip dynamometer.



**Procedure:**

Before starting the test, the handgrip dynamometer was kept dry, and subjects were instructed to use chalk powder for a firm grip. Each subject was asked to hold the handgrip dynamometer with the shooting hand with the elbow at a right angle, and then the tester adjusted the handle as per the subject's comfort. After that, subjects were asked to hold the dynamometer so that the base of the dynamometer was set between the thumb and index finger (on the heel of the hand), and the other four fingers were on the handle of the dynamometer. The tester immediately reset the dial to zero before starting the test. When the subject was ready, they had to squeeze the dynamometer with maximum effort. Three trials were allowed with a minimum one minute rest in between each squeeze.

**Scoring:**

Best out of the 3 trials was recorded for the study in kilograms.

**STATISTICAL ANALYSIS**

The means and standard deviations of both control and medicine ball exercises with resistance band exercises groups were calculated for shoulder strength for the pre as well as posttests. The collected data was analyzed using “t” test. Statistical significance was set to a priority at  $p < 0.05$ . All statistical tests were calculated using the statistical package for the social science (SPSS).



**TABLE - I**  
**COMPUTATION OF ‘T’ RATIO ON SHOULDER STRENGTH OF CRICKET PLAYERS ON EXPERIMENTAL GROUP AND CONTROL GROUP**  
(Scores in beat/min/seconds)

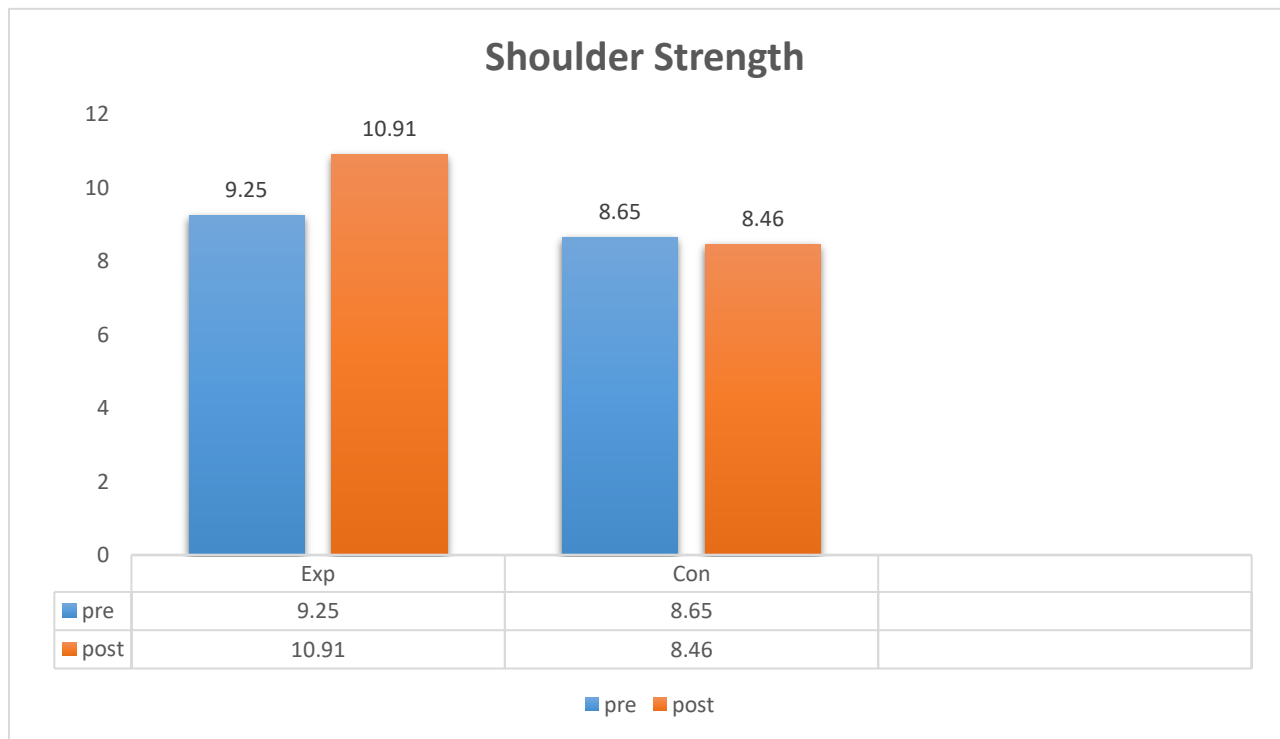
Group	Test	Mean	Std. Deviation	T ratio	
Shoulder Strength	Experimental Group	Pre test	9.25	.70836	17.87*
		Post test	10.91	.68415	
	Control Group	Pre test	8.65	.57491	1.24
		Post test	8.46	.44673	

\*Significant at 0.05 level of confidence (2.14)

Table I reveals the computation of mean, standard deviation and ‘t’ ratio on selected variables are strength endurance of experimental group. The obtained ‘t’ ratio on strength endurance were 17.87 and 1.24 respectively. The required table value was 2.14 for the degrees of freedom 1 and 14 at the 0.05 level of significance. Since the obtained ‘t’ values were greater than the table value it was found to be statistically significant.

**FIGURE – I**

**BAR DIAGRAM SHOWS THE MEAN VALUES OF PRE TEST AND POST TEST ON SHOULDER STRENGTH OF CRICKET PLAYERS EXPERIMENTAL AND CONTROL GROUP**





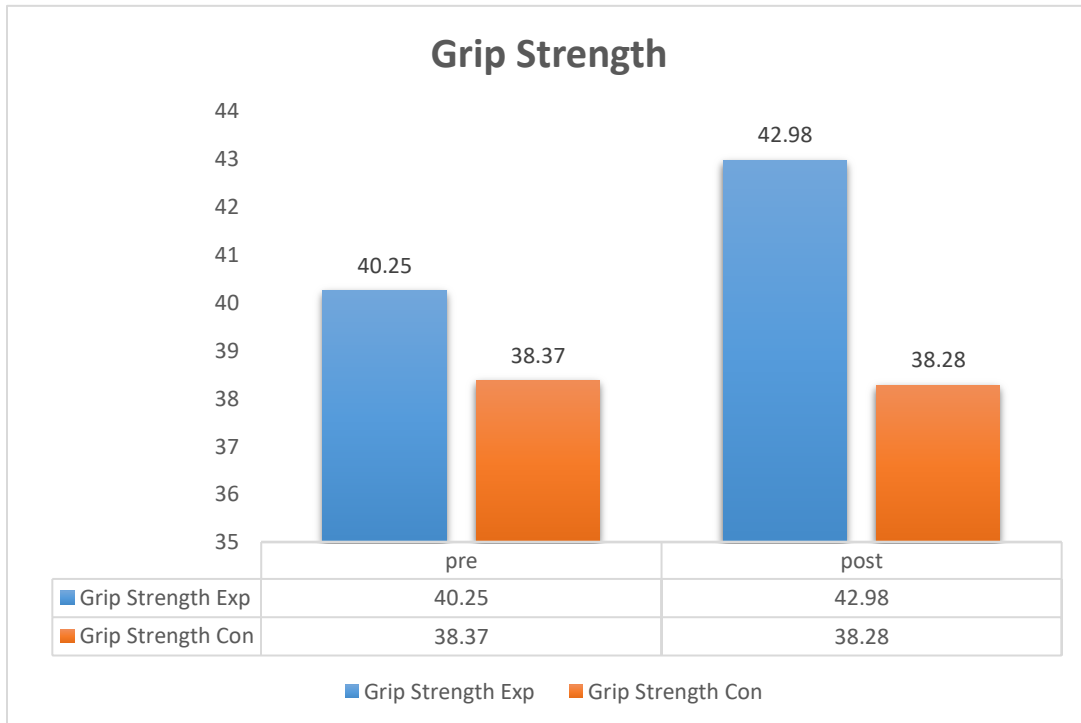
**TABLE - II**  
**COMPUTATION OF ‘T’ RATIO ON GRIP STRENGTH OF CRICKET PLAYERS ON EXPERIMENTAL GROUP AND CONTROL GROUP**  
(Scores in beat/min/seconds)

Group	Test		Mean	Std. Deviation	T ratio
Grip Strength	Experimental Group	Pre test	40.25	2.34321	9.76*
		Post test	42.98	2.09385	
	Control Group	Pre test	38.37	1.25625	1.44
		Post test	38.28	1.37807	

\*Significant at 0.05 level of confidence (2.14)

Table II reveals the computation of mean, standard deviation and ‘t’ ratio on selected variables are leg explosive power of experimental group. The obtained ‘t’ ratio on leg explosive power were 9.76 and 1.44 respectively. The required table value was 2.14 for the degrees of freedom 1 and 14 at the 0.05 level of significance. Since the obtained ‘t’ values were greater than the table value it was found to be statistically significant.

**FIGURE - II**  
**BAR DIAGRAM SHOWS THE MEAN VALUES OF PRE TEST AND POST TEST ON GRIP STRENGTH OF CRICKET PLAYERS EXPERIMENTAL AND CONTROL GROUP**



### DISCUSSION ON FINDINGS

The result of the present study should that methods of medicine ball with resistance band exercise had a significant and effect of upper body extremity cricket players. The cricket players who under well resistant band exercise with medicine ball exercise were able to improve that shoulder, elbow and wrist of joint movement.



Based on the current study a positive relationship is established between medicine ball with resistance band exercise to improve the selected physical fitness variables in the upper extremity of cricket players. Moreover, there are significant differences in motion output as a result of changes in the intensity practices. Thus, the selection of intensity of the preload spur in concurrence with the selection of intra-complex with cricket players seems to play the vital role in determining the effectiveness of the training regimes. The propositions of the contemporary study were very well experimented.

The result from the study may encourage and it demonstrates the benefits of medicine ball with resistance band exercise to overall playing ability. Cricket players not using resistance band to improve their mobility but also to improve performance. In addition, the result supports the improvements in programmes that occur in 8 weeks of medicine ball with resistance band exercises which can be useful during the preparatory phase before the competition for the sportsmen.

The result of the present study indicates that the medicine ball with resistance band exercises is an appropriate and effective programme to improve selected shoulder strength and grip strength of upper body edge of cricket players. Pre and posttest scores between the experimental group and control group were examined, there was a significant difference in posteromedial and posterior direction. Physical fitness variables likely to shoulder and grip strength to developing the medicine ball with resistance band exercises for the movement of bowling, batting, catching and throwing on fundamental skills improvement of performance especially for the beginners of the exercises.

**Ferrauti, et al., (2015)** Medicine ball training exercises seem to be a useful and inexpensive strength training strategy in enhancing functional performance by closely mimicking sport-specific movement activities.

**Phansopkar et al., (2021)** will depend on outcome measures that are shoulder strength, agility, speed and function. To conclude, this research may help badminton players to enhance their performance through the better exercise protocol.

**Rooney, et al., (2016).** Exercises with greater movement and speed specificity to throwing should be used in preference over exercises that are slower and have less movement specificity to the throwing motion. Cricket players should engage in power training to bridge the gap in performance between them and baseball players.

**Christie, et al., (2018)** changes for the experimental group were greater than those shown in the control group, likely owing to the additional conditioning sessions. Furthermore, significant ( $p < 0.05$ ) changes were observed between the two groups for the percentage body fat, flexibility, plank time, 20-m sprint time, push ups, and 25-m shuttle distance.

**Keerthirathne et al., (2021)** Strength training and resistance band training can be utilized to develop strength in the upper body and it may help to develop throwing velocity in other throwing sports, such as cricket, throw ball and so on.

**Robinson, et al., (2021)** resistance bands appear to be a practical alternative when traditional means of resistance training are not available. In addition, strength and conditioning coaches should not use the Chop-test or shoulder ROM to predict throwing performance.

**Ghodake, et al., (2016)** The results showed that there is positive correlation (moderate to strong) between grip strength and shoulder power. Thus during training program, focus should be given equally on improvement of both shoulder power and grip strength. As there is positive correlation between grip strength and shoulder power that grip strength can be used as a predictor of shoulder power.

**Febin, P. (2017)** results from the present study are very encouraging and demonstrate the benefits of plyometric push-ups in improving throwing distance as compared ball push-ups. A training program that would be more likely to adopt (do not take lot of time or effort) as a regime with low risk of muscle and connective tissue. This can be used during the last preparatory phase before in-season competition for athletes.

## CONCLUSIONS

From the results of the study and discussion the following conclusions were drawn.

1. From the findings, it was concluded that the cricket players doing the medicine ball exercises with resistance band for the more strengthening particularly upper body.
2. Within the limitation and on the basis of the findings, it was very clear that twelve weeks of medicine ball exercises with resistance band (MBWRB) produced significant changes in the strength parameters of cricket players.
3. It was clear that twelve weeks of medicine ball exercises with resistance band (MBWRB) produced significant changes in the grip strength of footballers.
4. In summary, the results of this study demonstrated that, the cricket coaches specific on upper body in the training schedule, particularly for cricket players.

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