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A Study to Find Out the Effectiveness of Swiss Ball Push-Up Trainin on Throwing Performance Among Cricket Players

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Abstract:
BACKROUND: Throwing is a very important skill for cricket players. Throwing is the most common problem seen among cricketers. Recent studies show that throwing velocity is an important aspect of fielding in cricket to affect the run scores and reduce theopponent run scoring opportunity, in this study Functional arm scale for throwers is type of outcome measure used to measure the throwing performance.
PURPOSES: To find the effect of Swiss ball push-up training on throwing performance among cricket players.
METHOD: The study design was experimental study;30 male cricket players were selected from WILLMA cricket club (Pondicherry). they divided into two groups, GROUPA (n=15) Swiss ball push up training and GROUP B (N=15) dynamic warm up training for four weeks. The outcome measure is FAST were measured in pre-test and post-test for 4 weeks.
RESULTS: the analytical test showed that Swiss ball push-up training and dynamic warm-up training (GROUP A) is more effective than dynamic warm up training alone (GROUP B) on throwing performance among cricket players.
CONCLUSION: This study concludes that the swiss ball push up training along with dynamic warm up training (GROUP A) shows significant effect in improving throwing performance when compare with dynamic warm up exercise alone (GROUP B) among cricket players following 4 weeks of intervention. Hence, the null hypothesis is rejected.

KEYWORDS: FAST SCALE, SWISS BALL, THROWING.

Introduction

Cricket is a one of the oldest organised sports but very few scientific studies are documented, it is a popular field-based team sports [1], the shoulder complex is involved ina highly skilled throwing motion which is part of many sports such as baseball, hand ball, cricket etc…Wick et al introduced the concept of thrower paradox in which the throwing shoulder must be sufficiently loose in order to throw but must have enough stability to prevent injuries.Upper limb injuries overcounted for 19.8% - 34.1% of total injuries in cricket fast bowlers sustain 42% of upper extremity injury release component of throwing

performance consist of implement velocity and accuracy both of which contribute to successful performance. the isolated scapula fatigue and resulting kinematic changes caused a disruption in kinetic energy transfer that led to a 26% decrease in accuracy [2]. A cricketer can suffer from a range of overuse injuries associated with all aspect of the game including running, throwing, batting, and bowling [3].Throwing is a primary movement skill that found on many games the development of this skill would be a best significance for athletes not only suitable physical movement are important in ball throwing but proper breathing also plays an important role[4] .There is an many aspect of throwing making it a compound skill to increase an proficiency in such as ball velocity, ball movement, arm velocity, arm movement distance approach, target angle etc…,however this aspect have small effect if throws cannot aim their throws precisely [4]. Adolescents ranging from 11-15(yearly mid adolescents) comprise the largest percentage age of baseball and soft ball players. shoulder and elbow injuries are commonly experienced by their athletes with baseball pitchers and soft ball players most likely to be injured. Even though push up is usually performed on the floor, changing the surface of support is known to alter the dynamics and demands of the exercise. In this, the swiss ball is a commonly used tool to increase stabilization demands by acting as an unstable surface[5].Push-ups on the swiss ball produced the maximum level of triceps and abdominal muscle activity[7]. A player has been stuck by a ball or bat rapid rotational movement, sliding and diving, collision with other players and overuse injuries [6]. This is usually associated with the weakness of scapula stabilizer [upper and lower trapezius, serratus anterior, deltoid, rhomboids and rotator cuff, muscle due to repetitive action of throwing the scapula muscle are highly active during the arm acceleration phase and deceleration phase [8].The capacity to throw a ball at higher speeds and with precision is of utmostimportance for successful performance in numerous ball sport, including cricket during throwing balanced and coordinated action of the rotator cuff muscle of the shoulder is paramount in providing glenohumeral joint mobility and stability [9].As there has not been any significant study addressed to find the effectiveness of swiss ball push-up training on throwing performance among cricket player. It is crucial to take the desired step to conduct the experimental study in this realm. PHASE OF THROWING 1.winding-up phase 2.cocking phase 3.follow through phase [10].

Materials And Methodology:

The study design was an experimental study with Convenient sampling technique, 30 cricket players were selected from WILLMA cricket academy (Pondicherry). They were allocated into two group, group A(n=15) swiss ball push-up training and dynamic warm-up training. Group B(n=15) dynamic warm-up training alone, The treatment duration is about 4days/week for 4 weeks, the outcome measure functional arm scale for throwers were measured in pre and post test for 4 week period.

study design : experimental study
study location : willma cricket academy (pondicherry)
sample size : 30 players
study duration : 6 months
sampling size calculation **:** experimental group [n = 15]: swiss ball push up training & control group [n = 15]: dynamic warm up training

Subjects & Selection Method: The study design was an experimental study, 30 male cricket players were selected from willma cricket academy (Pondicherry). They were allocated into two group, group A(n=15) swiss ball push-up training along with dynamic warm-up training . Group B(n=15) dynamic warm-up training alone, The treatment duration is about 4days/week for 4 weeks, the outcome measure functional arm scale for throwers were measured in pre and post test for 4 week period.

Inclusion Criteria:

1. Cricket players age between 13 to 19 years old.
2. FAST SCALE (40-80) moderate score.
3. Beginners who started training last one-two months.
4. Gender -male players.
5. Players who are willing to participate.

Exclusion Criteria:

1. Recent rotator cuff tear.
2. Bone disease.
3. Any shoulder and neck surgery in recent years.
4. Elite players.
5. Any neurological problem.
6. Players who all were doing strengthening exercises.
7. Any upper limb fracture and dislocation.
8. Spinal deformity.

Procedure:

The experimental study was conducted at the WILLMA cricket academy stadium for 30 male cricket players with age group of 13 -19. The methodology was explained at the subjects and got informed consent from the subjects. The subjects were asked about any recent injuries, training sessions, warm up routine and diet. And then height and BMI of the subjects were calculated. and hand strengthening protocol was explained to the subjects. Then the 30 subjects were divided into two groups. Group A (experimental group) and group B (control group) with subjects 15 in each group. Experimental group will get Swiss ball push up training along with conventional training and control group will get conventional training without any strengthening exercises. Duration of the exercise will be for 4 weeks,4 days per week and 30 mints per day.

GROUP A: swiss ball push-up training

FREQUENCY	4 DAYS/WEEK
REPETITION	3 SETS CONSISTED OF 10 REPETITIONS

GROUP B: Dynamic warm up training.

1. Shoulder external rotation
2. Lunge with multi planar shoulder blade squeeze.

FREQUENCY	4 DAYS/WEEK
REPETITION	3 SETS CONSISTED OF 10 REPETITIONS

Statistical Analysis & results:

A study **"a study to find out the effectiveness of swiss ball push-up training on throwing performance among cricket players"-** the pre-test and post interventional differences within the two groups were analysed using paired 't' test and the interventional difference between the two groups were analysed using unpaired 't' test for the outcome measure. Statistical analysis was set at p<0.0001

WITHIN THE GROUP ANALYSIS OF FUNCTIONAL ARM SCALEFOR THROWERS:

Showing the pre and post-test values of Group A: (paired t-test values)

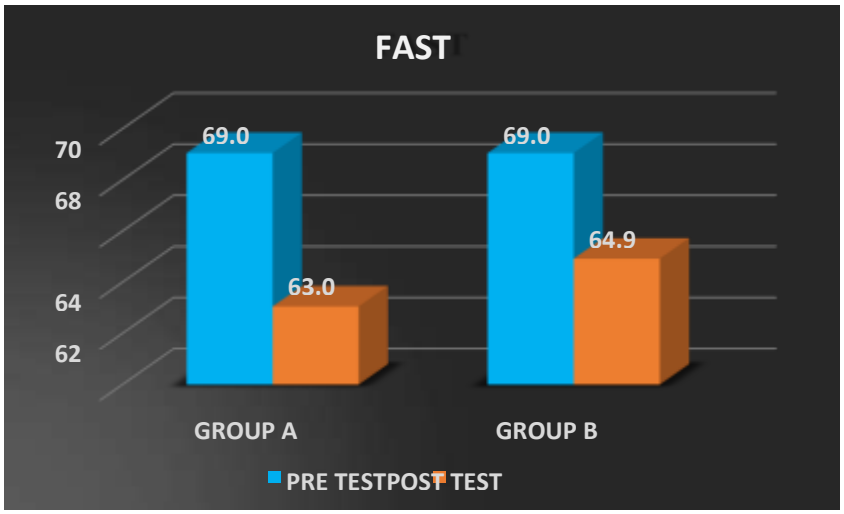
GROUP-A	Mean	SD	't'- value	'p'- value
Pre-test	69.06	6.06	14.9	<0.001
Post-test	63.06	5.81		

The 't' value of FAST in Group A is **14.9** with 9 degrees of freedom and consideredstatistically significant **('p' < 0.001)**

Showing the pre and post-test values of Group B: (paired t-test values)

GROUP-B	Mean	SD	't'- value	'p'- value
Pre-test	69.06	6.06		
Post-test	64.93	6.19	14.2	<0.001

The 't' value FAST in Group B is **14.2** with 9 degrees of freedom and consideredstatistically significant **('p' < 0.001)**



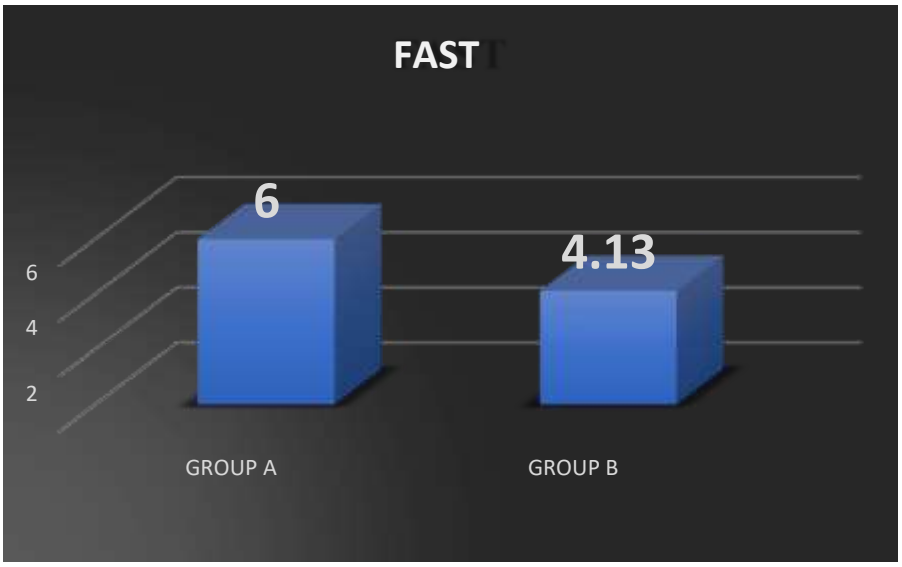
Graph 1: showing within the group analysis FAST in group A and group B

BETWEEN THE GROUP ANALYSIS OF FAST:

Tab. IV: Showing the mean of differences of group A & B: (unpaired t-test values)

	Mean	SD	t- value	'p'- value
GROUP-A	6	1.55	3.7609	<0.001
GROUP-B	4.13	1.12		

The 't' value of FAST SCORE between the groups is 3.7609 with 29 degrees of freedomand considered statistically significant **(p < 0.001)**



Graph 2: showing between the group analysis of FAST in group A and group B

FAST for Group A

The pre test and post test value of FAST for group A is analyzed using paired t test. The t value is 14.9 for 9 degree freedom and considered statistically significant **('p' < 0.0001)**

FAST for Group B

The pre test and post test value of FAST for group B is analyzed using paired t test. The t value is 14.2 for 9 degree freedom and considered statistically significant **('p' < 0.0001)**

ON ANALYSIS:-

It has been found that pre and post values of FAST score showed significant improvement in both experimental and control group and has shown a higher improvement in experimental group A.

Unpaired't'test :

The pre and post value of T test between group A and B is analyzed using unpaired T test for 29 degree of freedom with the t value 3.7609 and considered statistically significant.

The statistical analysis was done using **unpaired't'test** between the groups and shows statistical **significance** of **(p<0.0001).** between the group analysis of the mean of the post values show that the

experimental group is significant than the control group . there is more improvement of throwing performance in experimental group A than control group B.

DISCUSSION

This experimental study conducted to find out the effectiveness of Swiss ball pushup training on throwing performance among the cricket players. This study was selected for the purpose to improve the throwing performance among cricket player.

30 subjects who fulfilled the inclusion and exclusion criteria were taken with age group between 13 - 19 years in this study. They were allocated to two groups, group A andB, each containing 15 subjects. Swiss ball push-up training was given to experimental group (Group A) and dynamic warm up training was given to Control group (Group B). The outcome was measured by functional arm scale for throwers.

Gregory j Lehmen et., al (2006) studied the shoulder muscle EMG activityduring push up variation on and off a Swiss ball. the aim of the study was to determine if performing upper body closed kinetic chain exercises on a labile surface (Swiss ball)influences myoelectric amplitude when compared with a stable surface , surface myo-gram were recorded from the triceps ,pectoralis major ,latissimus dorsi ,rectus abdominus and external oblique while performing push up exercise with the feet or hands on a bench and separately on a Swiss ball, no muscle showed a change in activation level when the legs where supported by the Swiss ball instead of the bench.

Sung - Hwaseoet., al (2013) they conducted the study on surface EMG during the push -up plus exercise on a stable support or Swiss ball; scapular stabilizer muscleactivation. ten (n=10) healthy men volunteered for this study, all volunteers performed twosets of push up plus exercises and knee push up exercise in stable and unstable base of support. the muscle activities of five important scapular stabilizer muscles (upper trapezius, middle trapezius, lower trapezius, serratus anterior, latissimus dorsi). the RMS value of the trapezius during push-ups was always greater than those of the other muscles tested.

From above discussion the benefit of Swiss ball push-up training and dynamic warmup training that helps to improve the throwing performance among cricket players. So, the present study shown that significant improvement on throwing performance after the 4 weeks of intervention when compared to before intervention mean value.

LIMITATIONS

1. Small samples were selected.
2. Study duration was only 4 weeks.
3. Only cricket players were selected in this study.
4. Only age group between 13 – 19 were taken.

CONCLUSION

This study concludes that the swiss ball push up training along with dynamic warmup training (GROUP A) shows significant effect in improving throwing performancewhen compare with dynamic warm up exercise alone (GROUP B) among cricket players following 4 weeks of intervention. Hence, the null hypothesis is rejected.

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