



EFFECTS OF BOXING - SPECIFIC CIRCUIT TRAINING IN AMATEUR BOXERS.

Sujitkumar Pandey

Intern Late Shree Fakirbhai Pansare Education Foundation's College of Physiotherapy,

Dr. Pradeep Borkar*

Assistant Professor, Musculoskeletal Physiotherapy Department, Late Shree Fakirbhai Pansare Education Foundation's College of Physiotherapy *Corresponding Author

ABSTRACT **AIM & OBJECTIVE:** - To find out the effect of Boxing - Specific Circuit Training (BSCT) on upper limb muscle endurance in Amateur boxers.

METHODOLOGY: - Total samples (n=30), they are divided into Group A (Control group) & Group - B (Experimental group) using Randomized Controlled Trial (RCT), Group A performs Routine boxing training & Group - B performs BSCT, Progression was done after every 2 weeks in BSCT, Study duration was 6 -weeks for the both the groups, Pre & Post Assessment was done on Day 1 & 42 respectively using Pushup Test as an outcome measure.

RESULTS: - Both the groups had improvement in upper limb muscle endurance but Group - B had significant improvement ($p < 0.0001$) as compared to Group - A.

KEYWORDS : boxing - specific circuit training, pushup test, muscle endurance

INTRODUCTION

Amateur boxing is a sport comprised of high-intensity offensive and defensive manoeuvres, interspersed with short recovery periods (Smith, 2006). Three, three- minute rounds are completed, divided by one-minute rest intervals. Within standard contests, attacking consistently with accumulative force often leads to victory (Pierce, Reinbold, Lyngard, Goldman & Pastore, 2006). The winner of a contest is the boxer who amasses the greatest quantity of points over three rounds, or if the referee halts the contest (knockout/corner stoppage). "Circuit training is a method of fitness training that is designed to develop general, all-round physical and cardiovascular fitness." Scholich (1990:40) The Circuit training program was developed by **Morgan, G.T. , R.E. and Adamson**, in 1957 at the **University of Leeds in England.**⁽¹⁰⁾ Circuit training is a method of fitness training that is designed to develop general, all-round physical and cardiovascular fitness based on the requirements by the sport of the individual. A circuit consists of a no. of prescribed exercises that is to be done in a sequential manner. It contains rest intervals between the exercises so as to prevent fatigue.⁽¹⁰⁾⁽¹³⁾⁽¹⁴⁾

NEED OF STUDY

- Researches have proved that upper limb injuries are more as compared to lower limb injuries in boxers.⁽⁶⁾⁽⁷⁾ It has also been proved that there is significant co-relation of upper limb muscle imbalance & rate of injuries
- As the lack of strength, endurance and other fitness components are intrinsic risk factors for upper limb injuries⁽⁸⁾ there is a need to design an **optimal conditioning program** to improve the upper limb muscle performance in amateur boxers.

AIM

To find out the effect of BSCT on upper limb muscle endurance in amateur boxers.

OBJECTIVES

To find out the effect of BSCT on upper limb muscle endurance in amateur boxers.

METHODOLOGY

- Study type:- Interventional study.
- Study area:- Mumbai.
- Sampling type:- Randomised Controlled Trial (RCT)
- Population:- Amateur Class Boxers (Beginners).
- Sample size:- 30.
- Study duration:- 6 weeks.
- Study setup:- Boxing Institute, Mumbai.

MATERIALS

- Stopwatch ,Kettle ball
- Thera-tubes

- Dumbells
- Punching bag
- Boxing gloves
- Assessment sheets

INCLUSION CRITERIA

- Age 18 - 25 yrs.
- Males only.
- Beginners playing since 3 months.

EXCLUSION CRITERIA

- Unwilling individuals
- Any acute/recent injuries (including repetitive stress injuries)

OUTCOME MEASURE

PUSHUP TEST

The push-up fitness test (also called the press-up test) measures upper body endurance.

SCORING:- Record the number of correctly completed push-ups.

STUDY PROCEDURE

1. Ethical clearance from the Ethical Committee of the college was taken.
2. Ethical clearance from the Boxing Institute was taken.
3. Collection of samples & explaining the individuals about the circuit training that they will be undergoing.
4. Informed & Written consent was taken from every participating individual.
5. All the individuals were randomly divided into two groups as A (CONTROL GROUP) & B (EXPERIMENTAL GROUP) using the chit method.
6. Group-A performs 'DAILY ROUTINE TRAINING' of the coach & Group-B performs the 'BOXING - SPECIFIC CIRCUIT TRAINING'. Prior to start the training they had been given a demonstration of the exercises.
7. The circuit training includes the WARM UP exercises at the start & COOL DOWN exercises at the end & the Progression in the circuit training was done every 2-weeks. The circuit was performed for 4-days in a week.
8. **PRE & POST ASSESSMENT** was taken on **DAY 1 & 42.**

CONTROL GROUP EXERCISES

1. Warm up
2. Upper body strengthening
3. Focus pad workout with partner
4. Core strengthening
5. Punching bag workout
6. Lower body strengthening
7. Dodges session

8. Combination workouts
9. Sparring sessions
10. Stretching exercises

- The individual performs his routine exercises until exhausted.
- 3 mins of rest & hydration time is given between each exercise.

EXPERIMENTAL GROUP EXERCISES

WARM UP EXERCISES

1. AROM of upper limb.
2. AROM of lower limb.
3. Jogging.
4. Skipping.
5. Shuffling with punches.

COOL DOWN EXERCISES

1. Walking.
2. Stretching exercises.
3. Breathing exercises.

CIRCUIT 1 (1st - 2nd week)
SHOULDER WIDTH PUSHUPS 10REPS * 2 SETS
SQUAT HOPS 10REPS * 2 SETS
PUNCH COMBINATIONS 3 COMBOS * 2 SETS
BENCH PRESS DUMBBELLS 10REPS * 2 SETS
LATS PULL DOWN 10REPS * 2 SETS
NARROW WIDTH PUSHUPS 10REPS * 2 SETS
JABS THERATUBES 10REPS * 2 SETS
PRONE PLANKS 20 SECS * 2 SETS
KETTLE BALL HOLDS (5KG) 20 SECS * 2 SETS
SHADOW BOXING 2 MINS

CIRCUIT 2 (3rd - 4th week)
BROAD WIDTH PUSHUPS 10REPS * 2 SETS
DYNAMIC LUNGES 10REPS * 2 SETS
FOCUS PAD WORKOUTS 1 MINS * 2SETS
BICEPS CURLS DUMBBELLS 10REPS * 2 SETS
TRICEPS PUSHUPS 10REPS * 2 SETS
OVERHEAD PUSH - PRESS 10REPS * 2 SETS
ROUNDHOUSE THERATUBES 10REPS * 2 SETS
HEAD & LEG BALANCING 20 SECS * 2 SETS
KETTLE BALL HOLDS (5KG) 20 SECS * 2 SETS
SHADOW BOXING 2 MINS

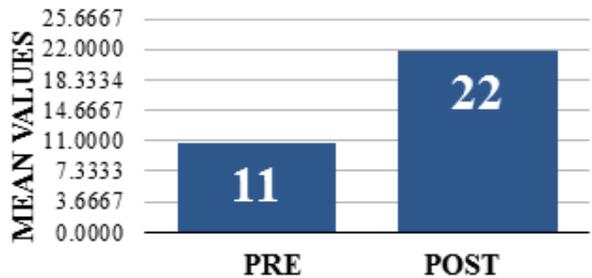
CIRCUIT 3 (5th - 6th week)
HANDSTAND PUSHUPS WITH SUPPORT 10REPS * 2 SETS
SQUAT HOPS + PUNCHES 10REPS * 2 SETS
COMBINATION WORKOUTS 1 MINS * 2 SETS
TRICEPS CURLS DUMBBELLS 10REPS * 2 SETS

BAR PULL UPS 10REPS * 2 SETS
SLEDGE HAMMER 10REPS * 2 SETS
UPPERCUT THERATUBES 10REPS * 2 SETS
SIDE PLANKS 20 SECS * 2 SETS
KETTLE BALL HOLDS (5KG) 20 SECS * 2 SETS
SHADOW BOXING 2 MINS

DATA ANALYSIS

Control group - pre & post assessment

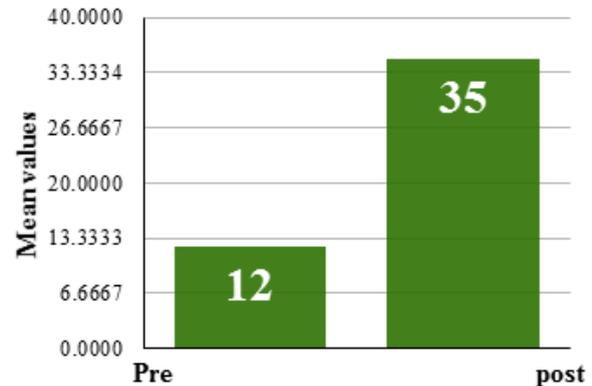
	MEAN	SD	T - value	P - value
PRE ASSESSMENT	10.75	2.9271	2.2009	< 0.05 (0.00000000009761)
POST ASSESSMENT	21.9167	3.2322		



Experimental group - pre & post assessment

	MEAN	SD	T-value	P-value
PRE ASSESSMENT	12.3333	1.5570	2.2009	< 0.05 (0.00000000001590)
POST ASSESSMENT	35	3.0748		

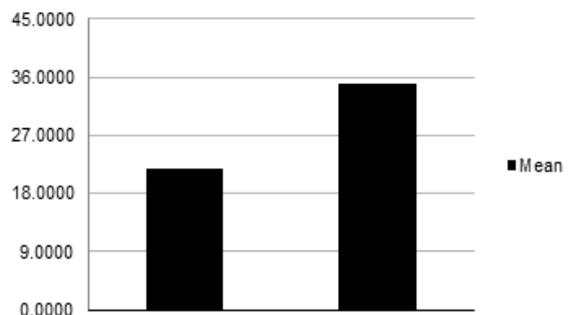
Post assessment - control &



Experimental group data (paired - t test)

	MEAN	SD	T - value	P - value
PRE ASSESSMENT	12.3333	1.5570	2.2009	< 0.05 (0.00000000001590)
POST ASSESSMENT	35	3.0748		

GROUP A AND GROUP B



DISCUSSION

Circuit training enables one part of body to recover from exercise while exercising the other area and therefore minimizes muscle fatigue. Also when muscle relaxes between each repetition of reciprocal muscle contractions which helps to maintain blood supply to contracting muscle and helps to delay the muscle fatigue. Studies have shown that the rest period between sets and exercises has a significant effect on the total training volume, decrease in maximal voluntary contraction, exercise torque and fatigue perception. Decreased training volume in isolated exercises and in a training session with short rest periods between sets and exercises might in part be the result of physical and/or metabolic stress. Resistance exercise with short rest intervals (1 min or less) leads to greater increases in circulating catecholamines, cortisol, and growth hormone than exercise bouts with longer rest intervals. Nor epinephrine, epinephrine, cortisol, and growth hormone have all been implicated as causative agents behind the immunological changes that occur as a result of heavy resistance exercise sessions. Results indicate that during a resistance exercise session, if sufficient time is available, resting 3 minutes between sets and exercises allows greater workout volume for the upper body exercises examined. Recovery of ATP requires 3 to 5 min, and Creatinine phosphate recovery occurs within 6 to 10 and likely influences subsequent exercise intensity¹⁰. Rest interval is a critical element of the circuit training program because it allows time for the body to prevent muscle fatigue or to reduce the adverse responses such as exercise induced delayed onset muscle soreness. Each exercise is separated by a period of rest intervals & total no of circuits to be performed during the training sessions varies depending upon training level of the athlete / individual (beginner, intermediate, advance). Each exercise is separated by a period of rest intervals & total no of circuits to be performed during the training sessions varies depending upon training level of the athlete / individual (beginner, intermediate, advance). Hence, on comparison Group B showed significant results as compared to Group A on upper limb muscle endurance. The BSCT contained specific no. of repetitions along with rest intervals between the sets so as to prevent muscle fatigue, which in turn helps the recovery of the muscles.⁽⁴⁾ Therefore, BSCT can be used on a regular training basis throughout the year to improve the endurance.

LIMITATIONS OF THE STUDY

Sample size.

The study was restricted only to males.

Other parameters like strength, punch force, reaction time could not be assessed.

CONCLUSION & FUTURE STUDY

From the data analysis, the following conclusions were drawn:- The Group - B achieved significant improvement in shoulder muscle endurance after implementation of Boxing - Specific Circuit Training (BSCT) when compared to Group - A. Therefore, the results and data analysis concludes that well structured BSCT improves the shoulder muscle endurance. The same study can be done on a large scale. Other parameters like punch force, strength & reaction time can also be assessed with the help of different outcome measures.

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