

Effect of Cross Fit Training During Post Season of Track and Field Athletes

Savitha Yogavarthini T¹, Muthukumaran Jothilingam²,
Praveen Vasanthan Murugan³, Andrew Anbarason⁴

¹Post Graduate, ²Professor, ³Post Graduate, ⁴Tutor, Saveetha College of Physiotherapy, Saveetha Institute of Medical and Technical Sciences, Chennai, Tamil Nadu, India.

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Abstract

Background: CrossFit is a high-intensity interval training that has gained popularity recently and incorporates a variety of functional activities. CrossFit is a comprehensive program for strength and conditioning. The majority of the CrossFit workouts are intense strength training sessions. This training method involves quick, repetitive movements with no rest. CrossFit exercise regimen aims to improve physical proficiency across fitness domains, including strength, flexibility, power, speed, coordination, agility, and balance. Various activities include powerlifting, Olympic weightlifting, sprinting, rowing, kettlebells and gymnastics.

Purpose: The Purpose of the study is to determine the effects of CrossFit training during post season of track and field athletes.

Methods: A total of 40 athletes were selected from Saveetha School Physical education, Chennai. Participants were randomly allocated into the control and experimental group, participants in the experimental group were trained for CrossFit training, and control group participants were asked to continue their exercise training for 6 weeks.

Results: The effectiveness was evaluated by using paired t-test. The post-test values of the experimental and control group medicine ball throw was 11.380 ± 0.657 and 10.205 ± 0.823 , the vertical jump test was 71.75 ± 4.77 and 66.55 ± 4.29 , the vo2 max test was 64.25 ± 4.35 and 56.95 ± 4.19 and 30m dash run test was 3.930 ± 0.256 and 4.130 ± 0.138 and P value less than 0.01, respectively

Conclusion: Hereby, it has been that Incorporating CrossFit training into the post-season training protocol can be very beneficial for track and field competitors.

Keywords: Competitive training, Speed endurance, Athletes, crossfit training, Power training.

Introduction

CrossFit has grown to be a popular sport and a sizable athlete population. The CrossFit competitive form was officially born in 2007 with the debut of the CrossFit games. The amount of people participating in the CrossFit games demonstrate how performance

and competitiveness have become part of this sport.⁽¹⁾ CrossFit is a high-intensity interval training that has gained popularity recently and incorporates a variety of functional activities.⁽²⁾ The majority of the CrossFit workouts are intense strength training sessions. This training method involves quick, repetitive

Corresponding Author: Muthukumaran Jothilingam, Professor, Saveetha College of Physiotherapy, Saveetha Institute of Medical and Technical Science, Chennai, Tamil nadu, India.

E-mail: muthukumaranjothilingam3@gmail.com

movements with no rest. Initially designed for military training, this program is gaining popularity among civilians.⁽⁴⁾ The functional motions are multi-joint movements that are carried out by the body contracting in waves from the core to the extremities. CrossFit exercise regimen aims to improve physical proficiency across fitness domains, including strength, flexibility, power, speed, coordination, agility, and balance. According to Glassman, the three energy pathways phosphate process, glycolytic pathway, and oxidative pathway are stressed by the CrossFit program, which is thought to improve performance by utilizing all energy pathways⁽⁴⁾. The philosophy behind CrossFit training is purely empirical, according to Glassman, the program's creator claims that only quantifiable, observable, repeatable facts, or statistics, can be used to support meaningful statements regarding safety, efficacy, and efficiency the three elements that make up any fitness plan and are most important and interdependent.⁽³⁾ CrossFit is a rapidly expanding fitness sport that incorporates both competition and general exercise training. CrossFit has lately found considerable improvements in wellness and health within the currently available literature.⁽⁵⁾ CrossFit training can help people of all fitness levels increase their aerobic capacity and body composition. Changes in diet, or a combination of diet and exercise, may have aided in altering body composition⁽⁶⁾. CrossFit has recently discovered important developments in health and wellness within the currently accessible literature. Additionally, anaerobic and cardiorespiratory performance also have a high impact on CrossFit training. The training program, like other strength training models, enhances anaerobic metabolism-derived power performance. With more than 11,000 connected gyms globally, CrossFit is becoming increasingly popular and well-known. CrossFit is a rapidly expanding fitness sport that incorporates both competition and general exercise training. CrossFit has lately found considerable improvements in wellness and health within the currently available literature.⁽⁴⁾ These intensive programs seem to carry a disproportionate risk of musculoskeletal injury, especially for beginners. Crossfit programs are labelled as "extreme conditioning programs", leading to missed duty time, medical attention, and extensive Rehabilitation ^(7,8) We must acknowledge

that, according to specialists, all workouts should be completed rapidly, in sets with a set amount of time, or without any rest periods in between. According to experts, those who use CrossFit in their training sessions have significantly increased levels of functional readiness.⁽⁸⁾ This sort of training focuses on the athlete's continuous improvement in their performance in individual exercises, whether through competition with a training partner or by competing against oneself. A wide range of activities, including powerlifting, Olympic weightlifting, sprinting, rowing, using kettlebells and other odd-shaped objects, and gymnastics. CrossFit contrast with other strength training techniques that follow a pattern that includes a rest and work cycle, to build physical fitness measures like strength, Power, and durability within an exercise program, a CrossFit model like Cindy CrossFit should incorporate resistance and durability models.⁽⁹⁾ The CrossFit training regimen also enhances anaerobic metabolism-derived power performance. Conversely, CrossFit has a continuous framework, unlike other forms of strength training that include a rest and work cycle. Most CrossFit training regimens don't include rest periods so participants may produce high power. In addition to this, people attempt to move quickly or to finish as much work as they can in a certain amount of time. Improvements in skeletal muscular strength, cardio-respiratory function, and metabolic management are just a few of the general health aspects that physical activity has been found to influence. Others have argued that despite the risks involved in CrossFit, high-intensity functional training programs like it offer an equivalent or lower risk of injury than many conventional physical training programs.^(10,11)

Aim

The Aim of the study is to determine the effects of CrossFit training during post season of track and field athletes.

Material and Method

This experimental study was carried out in the period of October 2022 to February 2023 with 40 track and field athletes, aged between 18-24 years of both genders from Saveetha School of physical education, Chennai. Samples were conveniently selected and allocated into experimental and control groups.

Inclusion criteria:

- Athletes who are continuously into sports for more than 2 years.
- Athletes who are in postseason
- Both genders were included.

Exclusion criteria:

- Athletes who are injured recently
- History of surgery in extremities and spine.
- Athletes who are in a structured exercise program.

Outcome Measure:

Speed test: The test aims to evaluate a person’s speed and acceleration over a 30-metre course. The speed and agility of an athlete are frequently assessed in sports and fitness tests for e.g. athlete run one 30-meter maximum sprint as quickly as they can while timing themselves as part of the test.⁽¹²⁾

Upper body power test:

A medicine ball throw, a typical method for determining power, was used to measure upper body strength. In order to measure upper body strength and explosive force, the overhead throw for distance includes launching the ball forward from above the head.⁽¹³⁾

Lower body power test:

The vertical jump test was assessed using lower

body power. The vertical jump test is a common assessment used to measure an individual’s lower-body power and explosive strength.⁽¹⁴⁾

VO2 Max: An athlete’s aerobic capacity and cardiovascular endurance is evaluated using the VO2 max test. The test was performed and measuring while running in treadmill or stationary bike.⁽¹⁵⁾

Procedure

A total of 40 athletes were selected from Saveetha School of physical education, Chennai. The aim of the study was explained to everyone and written informed consent was obtained. Athletes who are in the postseason are included and athletes who are injured recently and who are in structural exercise programs are excluded. All the athletes were randomly allocated into experimental and control groups using the opaque enclosed envelope method. Participants in the experimental group were trained with cross-fit training which was mentioned as training protocol for 6 weeks 5 days a week. While control group participants were asked to continue their regular exercise training for 6 weeks 5 days a week. At the end of the 6th week speed, v02 max, upper and lower body power were assessed. Speed was assessed using the 30m dash run test, vo2 max was assessed using the treadmill test, upper body power was assessed using the medicine ball throw and lower body power was assessed using vertical jump test.

Table 1: Training Protocol

	Monday	Tuesday	Wednesday	Thursday	Friday
Week 1	CrossFit total	500m row	Fight gone bad	3 rounds: 400m run 15 push-ups 25 sit-ups	15 min run
Week 2	Burpees	5 rounds: 200m run 10 goblet squat	20 min AMRAP: 5 deadlift 10 ring rows 50 jump rope	5 rounds: 5 hang power clean 20 sit-ups	4 rounds: 800m run 200m walk

Continue.....

Week 3	Front squat Power clean skill work	3 rounds: 400m run 10 knee raises 20 box jumps 10 pushups	20 min AMRAP: 10 Push-ups 20 lunges 400m run	5 rounds: 10 kettlebell swings 30 jump rope	Pull-ups
Week 4	20 min run at moderate pace	21-15-9 Thrusters ring row	20 min AMRAP: 3 wall-walk 5 Curtis p's 200m run	3 rounds: 50 jump rope 15 burpees 15 squats 15 sit ups	5 sets: 3 deadlifts snatch review
Week 5	Back/Hip extension GHD sit-ups 5x10 squat jump	4 rounds: 15 wall balls 20m run	20 min AMRAP: 1 min row/bike 10 pushups 20 kettlebell swings	4 rounds: 5 power clean 5 front squat 10 ring row 15 burpees	5 rounds: 400m 400m faster pace run
Week 6	8 min run 1 wall walk Hold 20 s	3 rounds: 400m run 15 power clean	CrossFit total	500m row	Fight gone bad

Data Analysis

To assess the significant difference between pre and post-test values, the Wilcoxon rank test was used. Additionally, to compare the two groups, the Mann-Whitney U test was utilized.

Result

All 40 athletes completed the study successfully pre-test and post-test values of medicine ball throw, vertical jump test, vo2.

Max and 30m dash run tests were presented in the following tables(2,3,4). Experimental group shows statistically significance than control group in all parameters with p value less than 0.001.

Table 2: Pre and Post-test values of experimental group

S.no	Outcome measures	Pre-test value		Post-test value		P value
1	Medicine-ball throw	9.050	0.826	11.380	0.657	<0.001
2	Vertical jump test	62.40	4.83	71.90	4.72	
3	Vo2 max	54.25	4.35	64.70	5.33	
4	30m dash run test	4.315	0.163	3.935	0.258	

Table 3: Pre and Post-test values of control group

S.no	Outcome measures	Pre-test value		Post-test value		P value
1	Medicine-ball throw	9.050	0.826	10.205	0.823	<0.001
2	Vertical jump test	60.40	4.83	66.55	4.29	
3	Vo2 max	52.25	4.35	56.95	4.19	
4	30m dash run test	4.375	0.125	4.130	0.138	

Table 4: Post-test values of experimental and control groups.

S.no	Outcome measures	Post-test value of the experimental group		Post-test value of the control group		P value
1	Medicine-ball throw	11.380	0.657	10.205	0.823	<0.001
2	Vertical jump test	71.75	4.77	66.55	4.29	
3	Vo2 max	64.25	4.35	56.95	4.19	
4	30m dash run test	3.930	0.256	4.130	0.138	

Discussion

CrossFit is a high-intensity, functional movement training that has gained popularity in recent years. It is a combination of weightlifting, gymnastics and cardio exercises that are designed to improve overall fitness and performance. Many track and field athletes incorporate CrossFit into their training programs especially during the Postseason.⁽¹⁰⁾ This study and other research have demonstrated the advantages to the CrossFit training regimen. More research is necessary despite the apparent benefits. Future research should compare the effects of CrossFit training to HIIT and other high-intensity workouts on individuals of various ages and athletic backgrounds, as well as on athletes who have played the sport for a long time and athletes who compete in the CrossFit games. The current study demonstrates that CrossFit training enhances exercise capacity related to all three separate energy systems, albeit more research is necessary.^(10,11) The impact of CrossFit on body composition, psycho-physiological factors, the risk of musculoskeletal injuries, life, and health difficulties, and psycho-social behavior have all been the subject of studies. This research has formed the basis of the current CrossFit scientific literature.⁽¹⁶⁾ The current study demonstrates that CrossFit training enhances exercise capacity related to all three separate energy systems. Crossfit training in comparison to HIPT on people of different ages and athletics backgrounds, as well as on athletes who participated in the sports for a long time and athletes who participated in CrossFit games. Balance, weight shifting, and proprioception were assessed in this study.

The new study is fascinating because it looked at a variety of variables in both a controlled laboratory environment and in actual life situations. Nine out of the fourteen variables analyzed showed substantial gains after just six weeks of CrossFit training,

including diastolic blood pressure, VO2 max, anaerobic capacity, CrossFit Total, maximum deadlift, maximum squat, maximum shoulder press, and 500m row. The results were particularly impressive because the longest workout only took 20 minutes, and most were even shorter. Short-duration training programs are essential because they encourage the adoption of high-intensity exercise. This is why improvements in aerobic capacity, anaerobic capacity, and strength are seen after such a quick workout.⁽¹⁷⁾

Conclusion

Hereby, it has been concluded that CrossFit training was one of the most influential factors in determining good athletic performance. This study found that the experimental group had a significant improvement in all outcomes. Incorporating CrossFit training into the postseason can be very beneficial for track and field competitors which will enhance the effective usage of skilled athletes in international meets.

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