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A comparative study on flexibility and explosive strength between resistance-trained individuals and crossfit participants

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Abstract

The purpose of the study was to find out the comparative analysis of flexibility and explosive strength between resistance-trained individuals and CrossFit participants. The study has been conducted on 30 resistance-trained individuals and 30 cross-fit participants. The subjects of Resistance Training were selected from Total Fitness Gym, Heirangoithong, Manipur and CrossFit subjects were selected from 7 Clan Strength and Conditioning, Nagampal, Manipur. The age of the subjects ranged between 20 and 30 years. The study was conducted on flexibility and explosive strength. The data was collected through sit and reach test for flexibility and standing broad jump for explosive strength. To find out significant differences between the groups, an independent 't'-test was used with the help of SPSS software. The level of significance chosen was 0.05. After the analysis, it was revealed that there was a significant difference in flexibility between the two groups. Whereas, no significant difference was found in explosive strength between resistance-trained individuals and cross-fit participants. Therefore, the study revealed that CrossFit participants are more flexible as compared to resistance-trained individuals. Future research can also be examined with larger sample size, health related physical fitness, motor fitness variables etc.

Keywords: Flexibility, explosive strength, resistance-trained individuals and crossfit participants

Introduction

Resistance training is a form of exercise intended to increase muscular strength and endurance. It involves exercising muscles using some form of resistance. This resistance could be weights, bands, or even your own bodyweight working against gravity. When doing resistance training, which is sometimes called strength training or weight training, you can focus on specific results, such as joint stability, muscular endurance, increased muscle size, strength, and power. Resistance training (RT) is a well-documented exercise modality to improve several physiological and psychological health parameters (Fiuza-Luces *et al.*, 2013) [4]. RT has been demonstrated to decrease visceral fat, glycated hemoglobin, low-density lipoprotein, and triglycerides, increase glucose transporter type 4, and increase muscle and bone mass. Also, the benefits of RT include improved physical performance, movement control, functional independence, cognitive abilities, body composition, body image, and self-esteem (Westcott, 2012) [12]. CrossFit (CF) is a form of high-intensity functional training that combines resistance exercises, gymnastics, and traditional aerobic modalities (e.g., cycling, rowing, and running) into single workouts that vary by day to elicit general physical preparedness (Glassman, 2011; Feito *et al.*, 2018) [5, 3]. This training form is enjoyed recreationally by participants of varying levels of fitness, training experience, age, and lifestyles (Thompson, 2017) [11] and also exists as its own sport.

CrossFit is one form of Resistance Exercise that is recognized as a high-intensity program that combines elements of mobility, technique, and strength (Smith *et al.*, 2013) [10] and has seen increasing popularity in recent years. CrossFit workouts often incorporate Olympic lifts and elements of gymnastic exercises using handstands and rings. A large part of CrossFit workouts also consists of the "workout of the day" or "WOD," where workouts are performed for the best time or performed in the "as many rounds as possible" style and are completed in a group

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environment, with some workouts performed as a shared workload. The social nature of CrossFit, in addition to the annual ‘CrossFit Games’, which include national qualifying workouts and regional competitions, is what has led to CrossFit being described as the “Sport of Fitness” (Hak *et al.*, 2013) [6]. Competitors who complete all workouts and rank high enough will progress to the next stage of the competition. Regardless of which stage, it is expected that each workout will consist of a set of challenges that will require some combination of strength, power, endurance, and/or sport-specific skill (Glassman, 2011) [5].

Evidence of CF training being more advantageous towards developing a variety of fitness outcomes in comparison to alternative training strategies (e.g., resistance training, high-intensity interval training) is equivocal. There is only one well-controlled study that exists where a variety of physiological parameters were examined between CF-trained participants and those trained in more traditional exercise modalities (e.g., resistance training) (de Sousa *et al.*, 2016) [2]. In that cross-sectional investigation, men with at least one year of CF training experience outperformed their resistance-trained (> 1 year) counterparts in a multi-stage shuttle run test and possessed a higher aerobic capacity; all other measures were statistically similar. While this study provides evidence in favor of CF training, there was no aerobic training requirement for the resistance-trained group, and the actual experience of the CF group was unclear beyond their having participated in the strategy for at least one year. It is possible that multiple physiological differences exist when experience is considered.

Therefore, taking views from the above studies conducted by

known researchers, the present study focused on comparing the flexibility and explosive strength of resistance-trained individuals and cross-fit participants. The study will be of benefits to coaches, health experts, players, fitness experts and trainers. It will also prove significant to those people who wish to attain and maintain good healthy living.

Objectives of the Study

1. To find out the difference between Resistance Trained Individuals and CrossFit participants on flexibility.
2. To compare the explosive strength between Resistance Trained Individuals and CrossFit participants.

Materials and Methods

The study has been conducted on 30 resistance-trained individuals and 30 CrossFit participants. The subjects of Resistance Training were selected from Total Fitness Gym, Heirangoithong, Manipur and CrossFit subjects were selected from 7 Clan Strength and Conditioning, Nagampal, Manipur. The age of the subjects ranged between 20 and 28 years. The study was conducted on flexibility and explosive strength. The data was collected through sit and reach test for flexibility and standing broad jump for explosive strength. To find out significant differences between the two groups, an independent ‘t’-test was used with the help of SPSS software. The level of significance chosen was 0.05.

Findings

The comparison of flexibility between Resistance Trained Individuals and CrossFit participants are depicted in table 1.

Table 1: Comparison of Scores on Flexibility (Sit and Reach test) Between Resistance Trained Individuals and CrossFit participants

Variable	Group	N	Mean	SD	SEM	MD	SED	t-value
Flexibility	Resistance Trained Individuals	30	32.38	5.72	1.04	3.45	1.79	1.92*
	CrossFit	30	35.83	8.01	1.46			

*Significance at .05 level
 ‘t’.05 (58) = 1.67

From the findings of the above table 1, the mean and standard deviation value with regard to Resistance Trained Individuals on the variable Flexibility (Sit and Reach test) were 32.38 and 5.72 whereas CrossFit participants were 35.83 and 8.01 respectively. After analysis of the data, the calculated ‘t’ value was 1.92 at 0.05 level of significance, which was more

than the tabulated value 1.67. So, it indicates that significant difference was found between Resistance Trained Individuals and CrossFit participants on flexibility.

The graphical representation of mean comparison between Resistance Trained Individuals and CrossFit participants on Flexibility (Sit and Reach test) are depicted in fig. 1.

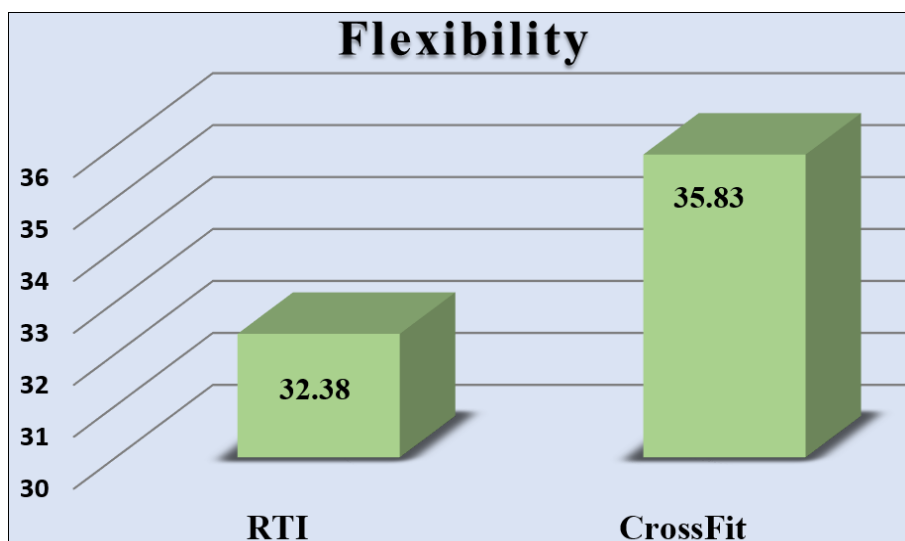


Fig 1: Mean Scores of Resistance Trained Individuals (RTI) and CrossFit participants on Sit and Reach test for Flexibility

The comparison on explosive strength between Resistance Trained Individuals and CrossFit participants are depicted in table 2.

Table 2: Comparison of Scores on Explosive Strength (Standing Broad Jump) Between Resistance Trained Individuals and CrossFit participants

Variable	Group	N	Mean	SD	SEM	MD	SED	t-value
Explosive Strength	Resistance trained individuals	30	1.83	0.44	0.08	0.02	0.11	0.16
	CrossFit	30	1.85	0.40	0.07			

*Significance at .05 level
 't' .05 (58) = 1.67

From the findings of the above table 2, the mean and standard deviation value with regard to Resistance Trained Individuals on the variable explosive strength were 1.83 and 0.44 whereas CrossFit participants were 1.85 and 0.40 respectively. After analysis of the data, the calculated 't'-value was 0.16 at 0.05 level of significance, which was lesser than the tabulated value 1.67. So, it indicates that no significant difference was

found between Resistance Trained Individuals and CrossFit participants. The graphical representation of mean comparison between Resistance Trained Individuals and CrossFit participants on explosive strength (standing broad jump) are depicted in fig. 2.

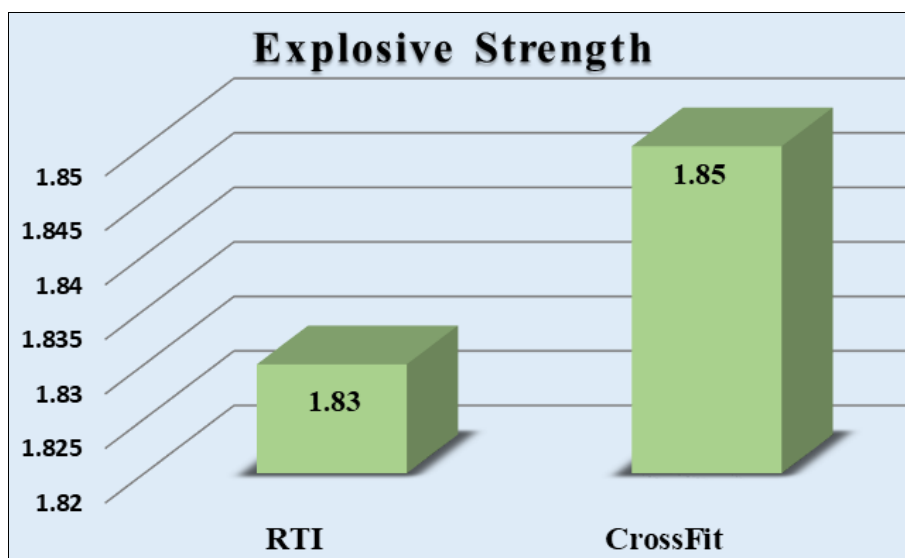


Fig 2: Mean Scores of Resistance Trained Individuals (RTI) and CrossFit participants on Explosive Strength (Standing Broad Jump)

Discussions

From the findings of the study, it was evident that both CrossFit participants and Resistance Trained Individuals have similar results in terms of Explosive Strength whereas in terms of Flexibility, CrossFit participants have higher flexibility as compared to Resistance Trained Individuals. In a similar study (Bilgin *et al.*, 2022) [1] found no significant difference between the groups that performed Cross fit training and traditional resistance training in terms of strength, muscular endurance, and vertical jump performances. Due to similar results between groups, Crossfit training can be recommended as an alternative method for strength development. Also in (Khan & Marwat, 2022) [7] findings of their 8-week intervention study it was evident that both the training programs contributed to enhancing performance of the cricket players but to be more precise the study demonstrates that CrossFit was more efficient by boosting the performance in the domains of Muscular endurance, Cardiovascular endurance and Flexibility while the Traditional (Conventional) training showed a more positive surge in the Muscular strength and Body composition. Whereas a separate research investigation (Notarnicola *et al.*, 2018) [9] showed that both functional training methods lead to improvements both from an anthropometric point of view and from an aerobic resistance point of view. Additionally, CrossFit method reveals a lower limb explosiveness and VO2max high values than the Trained

Resistance Exercise (TRX) group.

Resistance training has been popular in all parts of the world including the state of Manipur for a long time. There are various training centers available for resistance training or commonly known as weight training in various parts of the state both in Rural as well as Urban areas. However, CrossFit training is still a new concept in the state of Manipur and a very few has knowledge regarding their benefits. As only few training centers are available till now even in the Urban area, the result of the study will help the players, coaches, fitness experts and the society to gain further knowledge and increase the popularity of the CrossFit programs.

Conclusion

1. No significant difference was found in explosive strength (standing broad jump) between resistance-trained individuals and CrossFit participants.
2. Resistance-trained individuals had performed significantly better on flexibility as compared to CrossFit participants.

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