



## Impact of Moving Circuit Training on Muscular Strength and Leg Strength among Male Handball Players

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### Abstract

*The purpose of this study was to examine the impact of moving circuit training on leg strength and muscular strength. For this purpose 30 male handball players, aged 18 to 22 years took part in the study. Subjects were randomly assigned to either moving circuit training (n=15) or control (n=15) group. The training regimen lasted for eight weeks. The selected criterion variables were assessed using standard tests and procedures, before and after the training regimen. Analysis of covariance was used to determine the significant difference existing between pretest and posttest on selected criterion variables. The analysis of data revealed that eight weeks of moving circuit training had an impact of 10.63% on leg strength, 13.91% on muscular strength. These results suggest that moving circuit training has the significant influence on improving selected criterion variables.*

**Keywords:** Moving circuit training, Leg Strength and Muscular Strength.

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### Introduction

Moving circuit consists of a path or course equipped with obstacles or stations distributed along its length for exercising the human body to promote good health. In general, fitness trails can be natural or manmade, located in areas such as forest, transportation rights-of-way, parks, or urban settings. Equipment exists to provide specific forms of physiological exercise, and can consist of natural features including climbable rocks, trees, and river embankments, or manufactured products (stepping posts, chin-up and climbing bars) designed to provide similar physical challenges. The degree of difficulty of a course is determined by terrain slope, trail surface (dirt, grass, gravel, etc.), obstacle height (walls) or length (crawls) and other features. To know the efficacy of moving circuit training and its significant contribution to one's level of fitness, it was decided to take up this study.

### Methodology

For the purpose of this study, thirty male handball players from the various faculties of Annamalai University in the age group of 18 to 22 years were recruited, with their consent. The selected subjects were randomly assigned to both the moving circuit training and control groups of 15 each. The selected criterion variables were assessed using standard tests and

procedures, before and after the training regimen. Leg dynamometer and bent knee sit ups were used as criterion measures. The experimental group subjects underwent moving circuit training programme for three days a week for eight weeks. In the moving circuit training regimens, a series of eight exercise stations were formed in a standard 400 meters track. The subjects moved from one station to another, by jogging. The number of repetition for each exercises varied from ten to sixteen. The number of circuits varied between two-and-three for eight weeks, with a recovery interval of five minutes was given between circuits. The number of repetition was progressively increased once in two weeks. The experimental design used for the study was random group design involving thirty subjects, who were divided at random into two groups such moving circuit training group and control group of fifteen each. The data collected from the two groups prior to and after experimentation on leg strength and muscular strength were statistically examined for significant differences, if any, by applying the analysis of covariance (ANCOVA) with the help of SPSS package. In determining the significance of 'F' ratio the confidence interval was fixed at 0.05 level.

### Results

The descriptive analysis of data collected on selected strength and power parameters before and after eight weeks of moving circuit training is presented in Table -I.

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**Table I.** Computation of Mean and Standard Deviation on Selected Strength Parameters

Variables	Groups	Pretest		Posttest	
		$\bar{x}$	$\sigma$	$\bar{x}$	$\sigma$
Leg strength	Experimental	92.82	4.46	102.69	4.02
	Control	93.59	4.57	93.84	3.98
Muscular Strength	Experimental	24.87	2.29	28.33	3.68
	Control	24.67	2.28	25.07	3.08

The data collected from the two groups prior to and after experimentation on leg strength and muscular strength were statistically examined for significant

differences, if any, by applying the analysis of covariance (ANCOVA) with the help of SPSS package and it is presented in table-II.

**Table II.** Analysis of Covariance on Selected Strength Parameters of Moving Circuit Training and Control Groups

Variables	Groups	Adjusted Mean	SOV	Sum of Squares	df	Mean Square	'F' ratio
Leg strength	Experimental	101.26	B	236.71	1	236.71	36.93 *
	Control	93.72	W	173.04	27	6.41	
Muscular Strength	Experimental	28.13	B	248.83	1	248.83	45.57*
	Control	24.93	W	147.47	27	5.46	

\* Significant at 0.05 level.

The findings of the study shows that significant difference existing between moving circuit training and control group on leg strength and muscular strength, since the obtained 'F' ratio of 36.93 and 45.57 respectively were greater than the required table value of 4.21 for significance at 0.05 level of confidence for df of 1 and 27.

### Discussion on Findings

The literature thoroughly supports the evidence that a higher dose of moving circuit training produces greater increases in strength parameters. Studies have shown improvement in aerobic capacity from participation in circuit training (Kass & Castriotta, 1994; Peterson, Miller, Quinney, & Wenger, 1988). Kaikkonen and others(2000) observed significant improvement on cardiovascular and muscular fitness due to the effect of a 12-week low resistance circuit weight training. Gettman and others (1978) conducted a study to determine the changes elicited by circuit weight training and running (RN) programs conducted 3 days per week for 20 weeks. It was concluded that the circuit weight training program was most specific in improving strength.

### Conclusions

The result of this study demonstrated that, moving circuit training with repeated bouts of a combination of physical exercise has significant impact on leg strength and muscular strength among male handball players.

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