



IMPACT OF MODERATE INTENSITY CIRCUIT TRAINING PROGRAMME ON EXPLOSIVE POWER AND ANAEROBIC PERFORMANCE OF NRI STUDENTS

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ABSTRACT

The purpose of this study was to investigate the Impact of Moderate Intensity Circuit Training programme on Explosive Power and Anaerobic Performance of NRI students. The study involved forty male students (N=40) aged between 14 to 17 years, were randomly selected from Indian School, Doha-Qatar. The students were randomly divided into two group, Experimental Group (EG; N=20) and Control Group (CG; N=20). Baseline data of Explosive Power (EP) measured in Standing Broad Jump (SBJ) and Anaerobic Performance (AP) measured in anaerobic sprint test 50m were collected. The Moderate Intensity Circuit Training (MICT) includes 9 stations of one circuit with duration of 45/60 seconds of work/rest, 2 min rest in between the set. The training was performed for three days in a week for duration of 8 weeks. Data were analyzed by paired 't' test statistically significant level was set at 0.01. After the MICT programme, Explosive Power and Anaerobic Performance were significantly in the experimental group P<0.01 level of significant. The result showed that moderate intensity circuit training programme was effective to increase Explosive Power and Anaerobic Performance among NRI students.

KEYWORDS : Circuit training, Explosive power and Anaerobic performance.

INTRODUCTION

Circuit training programme is one of the popular and oldest scientific method of sports training. R.E. Morgan and G.T. Anderson are developed the circuit training programme in 1953 at the University of Leeds in England. The word circuit refers to the number of exercises selected carefully and arranged in a continues form. The success of circuit training is the accuracy of exercises during the performance of practice time. The original format of this training method is well arranged 9 to 12 stations. Exercises are normally performed for a specific period of time or a number of repetitions. Examples: each exercise is performing for 10 repetitions or performs for 30 seconds. The exercises are normally performed in machine, with weights, free hand or combined of all. The number and duration of the exercise will change depend up on the fitness of athlete, type of periodization of training, aim of the circuit and nature of the sports events. All the athletes are experienced the pain and benefits of circuit training.

Regular circuit training programme is to show a positive effect of cardiovascular effects of human body. During the circuit training programme, our all the energy systems are activated due to the different intensity exercises performed. Because of this, aerobic energy system of the athletes will be leading during some exercises and the anaerobic system will be leading in other exercise. Aerobic circuit training has a bigger effect of maximum oxygen intake (VO_2 max) and high intensity circuit training is more effective in improving strength and power of the athlete.

Statement of the Problems

Impact of moderate intensity circuit training on explosive power and anaerobic performance of NRI students.

METHODOLOGY

For conducting this study, 40 NRI boys students were collected randomly from Indian School, Doha-Qatar, aged between 14 to 17 years. All the students are Indian nationality but, they are living in Qatar for last few years. Pre-test was conducted for all students. The independent variables are Explosive power (EP) and Anaerobic performance (AP). For measuring EP, students performed in Standing Broad Jump (SBJ) and for measuring AP, students performed in 50M sprint. The students were divided into two groups randomly as Experimental Group (EG) and Control Group (CG). EG had 20 numbers (N=20) and CG had 20 numbers (N=20). Experimental group had performed Moderate Intensity Circuit Training (MICT) weekly three days for 8 weeks. Each MICT sections had 9 stations. Students were executed each exercise for 45 seconds duration with a rest interval of 60 sec. Each training sections were completed with 2 set of MICT with arrest interval of 5 min. Training includes High Knee, Medicine ball Throw, Hopping, Sit ups, Box jumping (21" Height), Push-ups, Hurdle Jump, Shuttle Run and Skipping. The CG was given active rest for eight weeks, but they were continuing their regular school activities. After completion of 8 weeks of MICT again the researcher conducted same test for both groups. The data was collected

and analyzed systematically using the 't' ratio. The level of statistical significant was set P<0.01 in all tests.

Analysis of Data

Table I: Descriptive statistic for the pre-test and post-test between control group and experimental group

Components		Control Group – 20		Experimental group – 20	
		Pre-test	Post-test	Pre-test	Post-test
50 M Dash	Mean	8.14	8.15	8.05	7.39
	SD	0.75	0.80	0.67	0.66
Standing Broad Jump	Mean	2.06	2.01	2.10	2.36
	SD	0.32	0.40	0.29	0.26

Based on the table I, in 50 m dash components, the mean score of the pre and post-test of the CG is 8.14 and 8.15 with a SD of 0.75 and 0.80 respectively. And mean score of pre and post-test the EG is 8.05 and 7.39 with a SD of 0.67 and 0.66 respectively. In the component of SBJ the pre and post-test of the CG is 2.06 and 2.01 with a SD of 0.32 and 0.40 respectively and the EG is 2.10 and 2.36 with a SD of 0.29 and 0.26 respectively.

Table II: Descriptive Statistics and 't' Ratio for 50 Meter Dash of Experimental and Control Groups

Group	Test	Mean \pm SD	MD	SE	't' ratio	Sig. (2 tailed)
Exp. Group	Pre- test	8.05 \pm 0.67	0.66	0.05	12.77*	.000
	Post-test	7.39 \pm 0.66				
Con. Group	Pre- test	8.14 \pm 0.75	-0.01	0.04	-0.397	.696
	Post-test	8.15 \pm 0.80				

The pre and post-test mean for 50 m Dash of EG are 8.05 and 7.39 respectively. The calculated 't' value for 50 m Dash in the EG is 12.77, which is significant at 0.01 level of confidence. The result shows that there was positive effect on moderate intensity circuit training on 50 m dash. The calculated 't' value for 50 m in the CG is -0.397, which is insignificant at 0.05 level of confidence. From the result of paired 't' test EG shows significant improvement from the result of MICT.

Graph I: Comparison of 50 M dash of pre-test and post-test of the control group and experimental group.

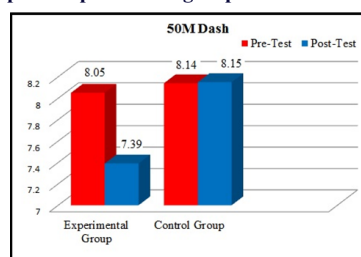
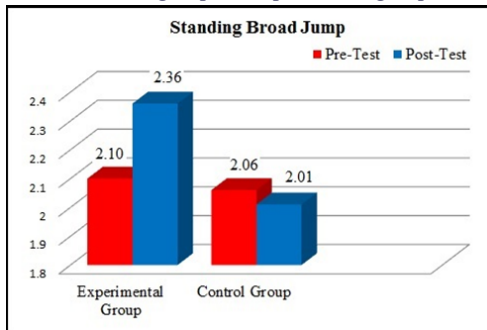


Table III: Descriptive Statistics and 't' Ratio for Standing Broad Jump of Experimental and Control Groups

Group	Test	Mean \pm SD	MD	SE	't' ratio	Sig. (2 tailed)
Exp. Group	Pre- test	2.10 \pm 0.29	-0.26	0.02	-14.99*	.04
	Post-test	2.36 \pm 0.26				
Con. Group	Pre- test	2.06 \pm 0.32	0.05	0.05	0.89	.383
	Post-test	2.01 \pm 0.40				

The pre and post test mean for SBJ of EG is 2.10 and 2.36 respectively. The calculated 't' value for SBJ in the experimental group is -14.99, which is significant at 0.01 level of confidence. The result shows that there was positive effect on moderate intensity circuit training on SBJ. The calculated 't' value for SBJ in the CG is 0.89, which is insignificant at 0.05 level of confidence. From the result of paired 't' test EG shows significant improvement from the result of MICT.

-Graph II: Comparison of Standing Broad Jump of pre-test and post-test of the control group and experimental group.

RESULT OF THE STUDY

The 8 weeks of moderate intensity circuit training programme of NRI students is showing that, there have significant improvements in the experimental group compared to control group in the components of explosive power. Control group has not showing any significant improvement in their performance. Another component anaerobic performance is also showing that, there had significant improvement in the experimental group compared to control group. Control group has not showing any significant improvement in their performance.

DISCUSSION ON FINDINGS

The experimental group of these study followed by 8 weeks of moderate intensity circuit training programme is showing significant improvement in the result. After the 8 weeks of training programme, the explosive power of experimental group had changed from 2.10 \pm 0.29 to 2.36 \pm 0.26, $P < 0.01$. Such increase of explosive power is due to the explosive type of exercises in the circuit training stations like Hopping, Box jumping, Hurdle jump and Skipping. These type of exercises helps to improve the lower body explosive power with a 't' ratio of -14.99. Because of this, Experimental group had shown significant improvement in the result and Control group had not shown any significant improvement. The result of Moderate Intensity Circuit Training programme shows the significant improvement in anaerobic performance of experimental group. The anaerobic performance of experimental group had significant improvement from 8.05 \pm 0.67 to 7.39 \pm 0.66, $p < 0.01$. Such decrease of time from pre-test to post-test is showing the increasing speed of the subject. Anaerobic performance increased due to the different type of speed improvement circuit training exercises like High knee, Hopping, Shuttle run and Skipping etc. Because of these exercises, the anaerobic performance of the experimental group had shown the significant improvement with a 't' ratio of 12.77 and control group had not shown any significant improvement.

Kharsheed Ahmed Naikoo (2018) conducted an experimental study of Moderate Intensity Circuit Training (MICT) about the male football players. In this study, he found that MICT helps to improve the anaerobic performance of the subject. Wirat Sonchan (2017) conducted a research study about the effect of circuit training programme on muscle strength, agility, anaerobic performance and cardiovascular endurance. The result of this research was shown that circuit training programme had significant improvement in muscle strength and in anaerobic performance. The above two experimental studies of circuit training shows that, circuit training with moderate intensity and high intensity always helps to improve the muscular power and anaerobic performance. This result is a strong support of the

current research study and proves that, Moderate Intensity Circuit Training programme is helping to improve the explosive power and anaerobic performance of NRI students.

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