EFFECT OF SKILL BASED CIRCUIT TRAINING AND DETRAINING IMPACT ON MAXIMUM OXYGEN CONSUMPTION AMONG MALE KABADDI PLAYERS

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ABSTRACT

The aim of this investigation is to find out the benefits and adverse effect of skill based circuit and detraining impact on Vo_2max of kabaddi players. To achieve the purpose of the study the investigator selected 40 male kabaddi players as subjects in the age group of 18 to 23 years and they were randomly assigned into two equal groups of 20 each. Group-I performed skill based circuit training and group II acted as control. Control group was restrained to participate in any specific training programme. The subjects were tested on Vo_2max by conducting Cooper Vo_2max test. Using a two-way (2 x 5) factorial ANOVA with last factor repeated measures, the data gathered from the two groups (skill based circuit & control) at the time of pre and post experimentation in addition to detraining phase(three cessations) were statistically examined. The results of the study showed that Skill based circuit training have extensively improved the Vo_2max. During detraining period no significant deterioration on Vo_2max was found up to first detraining period (10days) thereafter it was started declining towards the baseline.

Keywords: *Skill based circuit and detraining, Vo_2max, Kabaddi players*

INTRODUCTION

A skill refers as the acquisition of the fundamental sports movement is called skill. The skill is the basic essential and fundamental aspects of the game of kabaddi, not only in the game of kabaddi, it is essential for all the game. Most of the human's everyday movements are initially acquired with the help of parents or teacher, while others we gain through trial and error. In sporting situations, many of these basic movements act as foundational skills for more complex actions that may take years to master. The effectiveness of the coach in facilitating the learning of such skilled movements can be enhanced through a more detailed understanding of how athletes learn to execute skills effectively.

Athletes in team sports are increasingly using game based training to increase their physical preparedness and talent. The idea behind using games for training is that when the physiological demands and movement patterns mimic those of the sport, performance will increase the most. There aren't many studies examining the effectiveness of game based training, therefore many of the benefits and drawbacks that have been proposed are based on anecdotal information.

Circuit training is best for beginners and those of average fitness looking to tone up and get in shape. Athletes and sports people would probably only want to use circuits early in the off-season as basic strength and conditioning work, or as an alternative anaerobic interval training method or during an injury rehabilitation period to help maintain aerobic fitness. Both aerobic fitness and strength are better improved by traditional methods. Train hard and be safe. However, endurance athletes and games players may choose to use circuit weight training routines to build and maintain moderate strength while at the same time benefiting from its interval type content, which develop anaerobic endurance.

Potential circuit training exercises that can be used to develops short-term muscular endurance. This type of strength endurance is important in many prolonged sports with intermittent bouts of activity. These circuit training exercises can also be used by non-athletes to develop general fitness. In this respect, circuit training is very time efficient helping to develop strength and stamina in a single session Pure endurance athletes still require excellent strength endurance but the nature of their events requires a slightly different approach. Exercise selection is governed by the principle of specificity**.** The circuit training exercises selected must train movements that the athlete will perform during competition. A general circuit class might expect to see in a gym will develop muscular endurance but it won't be specific to any particular sport.

Detraining is equally important but that has been given considerably less attention by the athletes and the coaches and practically ignored by the research scholars in exercise and sports sciences. Detraining induces a partial or complete loss of training induced adaptations in response to insufficient training stimuli. It has been suggested by Wilmore and Costill (1994) that untrained individuals who train and produce significant improvements, lose some conditioning within two weeks of detraining. Baechle (1994) stated that when detraining occurs, the physiological function goes back to the normal untrained state of the individual.

The influence of detraining on physiological parameters of kabaddi players has received little attention and not completely understood. Few studies have only assessed the longevity of changes after training and detraining. Therefore, the present study was designed to determine the effects of skill based circuit training and detraining impact on physiological parameters of kabaddi players. Hence, this study was planned.

METHODOLOGY

To achieve the purpose of the study the investigator selected 40 male kabaddi players as subjects in the age group of 18 to 23 years and they were randomly assigned into two equal groups of 20 each. Group-I performed skill based circuit training and group II acted as control. Control group was restrained to participate in any specific training programme. Further, the researcher was interested in finding out the detraining impact on strength Vo_2max. The subjects were tested on Vo_2max by conducting Cooper Vo_2max test.

Training Protocol

In this study, training was done under close supervision with frequent adjustments in training intensity to maintain the desired training stimulus. The training programme is scheduled for one session a day. Each session lasted sixty minutes approximately including warming up and warming down. During the training period, the experimental group underwent skill based circuit training. After the completion of twelve-weeks of training the subjects of group-I were physically detrained for thirty days. During this period, the subjects of the experimental group were ceased with the training.

Collection of Data

Pretest data were collected prior to the training programme and posttest data were collected immediately after the twelve-weeks of training programme from both the experimental and control groups. During the detraining period the data were collected once in ten days for 30 days from both the experimental and control groups.

Statistical Technique

The data collected from the two groups prior to and post experimentation and during detraining were statistically analyzed by using two way (2 x 5) factorial ANOVA with last factor repeated measures. The simple effect and the Scheffe's test were used as follow up and post hoc test. The analysis of data on Vo_2max is presented in table-I to V.

RESULTS

The kabaddi players Vo2max data obtained during 5 different testing periods from the two groups(skill based circuit & control), were analyzed (Descriptive Analysis) and the derived mean values (M) as well as S.D(standard deviation) scores are shown in table-1.

Table-1: Descriptive Analysis Results on Vo2max Data (5 Testing Periods) of Kabaddi Players Belongs to Skill based circuit and Control Groups

		Test before and after Training		Tests during Detraining Period		
Groups		**Pre**	**Post**	**First**	**Second**	**Third**
Skill based circuit Training Group	Mean	30.40	35.40	34.80	33.80	32.80
	S.D	1.39	1.39	1.10	1.10	1.11
Control Group	Mean	30.20	30.30	30.35	30.45	30.55
	S.D	1.64	1.55	1.56	1.35	1.63

The skill based circuit group kabaddi player's Vo2max mean values (M) as well as S.D(standard deviation) scores of pre, post and three detraining period data are 30.40±1.39, 35.40±1.39, 34.80±1.10, 33.80±1.10 and 32.80±1.11. Similarly, the control group kabaddi player's Vo2max mean values (M) as well as S.D(standard deviation) scores of pre, post and three detraining period data are 30.20±1.64, 30.30±1.55, 30.35.±1.56, 30.45±1.35 and 30.55±1.63.

In order to verify the impact of detraining, all the two preferred group's (skill based circuit & control) collected Vo2max data during five various testing periods (pre, post test & three detraining) were further calculated by two(2x5) way factorial (2x5) ANOVA (*last factor repeated*) as in table- 2.

Table -2: Results of Two Factor ANOVA (*Last Factor Repeated*)on Vo2max of Groups(2) at Different Tests (5 Tests)

Source of Variance	Sum of Squares (SS)	df	Mean Squares(MS)	Derived "F" ratio
First Factor(Groups)	16.40	1	16.40	8.61*
Group Error	72.37	38	1.90	
Second Factor(Five Tests)	160.77	4	40.19	35.25*
First & Second Factors-(Interaction) (Groups &Tests)	150.13	4	37.53	32.92*
Error	215.90	190	1.14	

[Table values for df 1&38, 4&190 are 4.10 & 2.37 (.05level)]

This ANOVA (two way) statistics (2groups & 5tests) results authenticate that the first factor [factor-I (2groups)] 'F' value 8.61 (df=1&38) is better (8.61>4.10) than needed table value(4.10). Likewise, the second factor [factor-II (5test)] 'F' value 35.25 (df=4&190) is also better (35.25>2.37) than needed table value(2.37). It substantiate that, irrespective of all tests (pre, post & 3 detraining data)the Vo2max of the skill based circuit as well as control groups

[factor-I (2groups)] kabaddi players differ from one another. Similarly, irrespective of groups (skill based circuit & control) the kabaddi player's Vo2max differ among all five tests (pre, post & 3detraining period data).

Further, the 'F' value (32.92) acquired for Interaction effect [Groups(factor-I) x Tests(factor-II)] is also better (32.92>2.37) than the table value[2.37(.05level)] required[df4&190=2.37(.05level)]. This result (Interaction effect) on Vo2max confirm that, major deviation subsist between each tests of both groups (skill based circuit &control) and also among tests(pre, post & 3 detraining data) of within every group (skill based circuit &control).

Then the simple effect (follow-up test) test was applied and the final outcomes are accessible in table-3.

Table – 3: Simple Effect Test Results of Groups (Skill based circuit &Control)at Different Tests (Five Test Scores) on Vo2max

Source of Variance (SoV)	Sum of Squares(SS)	df	Mean Squares(MS)	"F" ratio
Two Groups at Pretest	0.40	1	0.40	0.35
Two Groups at Posttest	260.10	1	260.10	228.16
Groups at 1st detraining period	198.02	1	198.02	173.70
Groups at 2nd detraining period	112.22	1	112.22	98.44
Groups at 3rd detraining period	50.62	1	50.62	44.40
Five Tests of Group- I	309.44	4	77.36	67.86
Five Tests of Group-II (Control)	1.46	4	0.36	0.32
Error	215.90	190	1.14	

[Table values for df 1&190, 4&190 are 3.84 & 2.37 (.05level)]

The derived follow-up test (simple effect test) result('F' ratio) for post test of two groups (228.16), both groups during first detraining stage (173.70), both groups during second detraining stage (98.44), and both groups during third detraining stage (44.40 are superior (>3.84) to the needed table value [df1&190=3.84(0.05 level)] for significant. Thus, the Vo2max scores of both (skill based circuit & control) group kabaddi players be different during the pre, post and detraining (three) periods. The derived follow-up test (simple effect test) result('F' ratio) for pre test of two groups(0.35) did not differ significantly.

While comparing all five tests within each groups independently, the calculated 'F' value (67.86) for tests (five tests) within skill based circuit training group is superior (67.86>2.37) but, all five tests within control group 'F' (0.32) is lesser than the needed table

value [df4&190=2.37(0.05 level)] for significant. Consequently, all five tests within skill based circuit training group vary noticeably while; all five tests within control group didn't be different on Vo2max. As the derived 'F' ratio(simple effect) outcome is much greater, the post hoc (Scheffe'S) test statistical procedure was followed (table-4).

Table – 4: Scheffe's Test Results of Skill Based Circuit Training Group at Different Tests (Five Test Scores) on Vo2max

Training Period		Detraining Period			MD	CI
Pre	Post	I	II	III		
30.40	35.40				5.00*	1.01
30.40		34.80			4.40*	1.01
30.40			33.80		3.40*	1.01
30.40				32.80	2.40*	1.01
	35.40	34.80			0.60	1.01
	35.40		33.80		1.60*	1.01
	35.40			32.80	2.60*	1.01
		34.80	33.80		1.00	1.01
		34.80		32.80	2.00*	1.01
			33.80	32.80	1.00	1.01

**Significant(.05 level)*

The paired mean differences(MD) between pre and post test (5.00), pre and detraining-I(4.40), pre and detraining-II(3.40), pre and detraining-III(2.40), post and detraining-II(1.60), post and detraining-III(2.60), 1st and 3rd detraining(2.00) of training group(skill based circuit) are superior to confidence interval value [CI=1.01(0.05level)] but MD between post and detraining-I(0.60), 1st and 2nd detraining(1.00), and 2nd and 3rd detraining(1.00) values are lesser than CI [CI=1.01]value on field goal speed test. The kabaddi player's enhanced Vo2max due to training (skill based circuit)were sustained during the first(10days) detraining period afterwards it was started decline towards pre test value from the 2nd (20days) detraining stage.

DISCUSSION

The use of games in training is based on the premise that the greatest improvements in performance occur when the physiological demands and movements patterns replicate the demands of the sport. However, studies investigating the effectiveness of game-based training are limited, with many of the suggested advantages and disadvantages of game-based training based on anecdotal evidence (Bishop, 2008). The concept of using games to develop skill is based on early skill-acquisition studies that have demonstrated greater learning

benefits (as evidenced from retention and transfer tests) in skills taught under random and variable practice conditions (Magill, 2001). It is well documented that skills learned under fixed and blocked conditions (i.e., repetitive performance of the same skill under the same conditions before progressing to the next skill) result in greater short-term improvements in performance (Magill, 2001; Porter et al., 2007). However, when tested following a period of non-training, subjects who learned under random and variable conditions (i.e., frequently performing different skills under variable conditions) demonstrated greater retention of skill, indicating greater long-term learning. Furthermore, these improvements transferred to the performance of other similar skills (Magill, 2001).

Many training improvements are lost within several weeks, even days, if an athlete stops exercising. During the competition period, elite athletes cannot afford complete passive rest for more than three days in a row (typically only 1 or 2 days). The reduction or cessation of training brings about substantial losses in adaptation effects. However, athletes to a certain extent can sustain the acquired training benefits over time without extensively training them continually. De-adaptation, as well as adaptation, takes time. If athletes exclude a given group of exercise from training protocols, they gradually lose the adaptation. Four factors mainly determine the time course of detraining such as duration of the immediately preceding period of training, training experience of the athletes, targeted motor abilities and amount of specific training loads during detraining (Zatsiorsky, 1995).

CONCLUSION

The results of the study showed that Skill based circuit training have extensively improved the chosen physiological parameter Vo2max. During detraining period no significant deterioration on Vo2max was found up to first detraining period (10days) thereafter it was started declining towards the baseline. Skill based circuit training is important to improve overall performance related fitness of kabaddi game. So, for the better improvement players should participate in programmed skill based circuit training. Since training induced adaptations are declined due to the impact of detraining, the detraining period should not exceed one week, to maintain the efficiency of lungs.

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