

Influence of Flywheel and Seashore Training Packages on Selected Physiological Parameters among College Men Handbal Players

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ABSTRACT

This study was designed to investigate the influence of flywheel and seashore training packages on selected physiological parameters among college men handball players. To achieve the purpose of the study (N=45) forty five men handball players were selected from SKSS Arts College, Thirupanandal, Tamilnadu, India as subjects. The age of the subjects ranged from 19 to 23years. The selected subjects were divided into three equal groups (N=15). Group I underwent flywheel training. Group II underwent seashore training. Group III acted as control group who did not undergo any specialized training program other than their daily routine. The physiological parameters such as blood pressure, resting heart rate and breathe holding time were selected as dependent variables and they were assessed by sphygmomanometer, manual pulse check and manual method respectively. The subjects were concerned with their particular training for a period of six weeks, alternatively three days per week. The collected data from three groups prior to and immediately after the training programme on selected criterion variables were statistically analyzed with analysis of covariance (ANCOVA). The level of confidence was fixed at 0.05 for all the cases to test the hypothesis. The result of the study reveals that the flywheel training and seashore training groups achieved significant improvement on selected physiological parameters such as blood pressure, resting heart rate and breathe holding time of college men handball players.

Keywords: Flywheel Training, Seashore Training, Blood Pressure, Resting Heart Rate and Breathe Holding Time.

Introduction

Handball

To research the progress of handball it is important to go back thousands of years because the fundamental movements of handball viz., running, jumping and throwing were developed at the same time with the development of the human being, as instruments of survival. The act of throwing arm was found since the prehistoric age which is witnessed in the cave drawing such as stone and javelin throwing of the primitive man.

Handball is one of the popular sports in Europe (alter soccer) and it is also growing rapidly in Africa and Northern Asia. It is played both at national and continental level in America and it is very popular in Oceania too. Hand ball is of different forms from the field (Outdoor) handball, to the now popular

Olympic (Indoor) handball played on a 40m × 20m court to the recently introduced beach (Sand) handball played on the sands of a beach **chelly MS, H. S. (2014)**.

Flywheel Training

The use of flywheels to provide resistance dates back to 1796 when Francis Lowndes described a whole-body exercise device called Gymnastic on, which was based on the FW principle and designed for working the muscles of the legs and upper body at the same time (Bakewell 1997). Then, in the first decades of the twentieth century A.V. Hill, August Krogh, Hansen and Lindhard and associates independently conducted experiments based on this mechanical FW principle (Krogh and Skand 1913, Hill 1920, 1922, Hansen and Lindhard 1923). Since then, the first commercial use FW machines evolved from several research findings and challenges in the 1990's when researchers at the Karolinska Institute in Stockholm introduced iso-inertial resistance (Yoyo) exercise using spinning flywheels (Berg and Tesch 1992, 1994). After being tested in individuals subjected to various established spaceflight analogs, a multi-mode Yoyo exercise machine was then installed on the International Space Station in 2009. Since then this exercise intervention has found several terrestrial applications and shown increasing evidence in enhancing sports performance, preventing sports injuries and aiding neurological or orthopaedic rehabilitation as well providing evidence to promote skeletal muscle adaptations in terms of strength, power and size in healthy subjects and athletes (**Tesch et al. 2017**).

Sea shore Training

Sea shore training is another form of sand training where the surface is wet and hard in nature. It is the training on the wet sand that lies closer to the sea. A falling of low tide creates the hard packed even surface for running. As the water recedes, it hardens the sand. In offshore training, one can run close to the edge of the water which provides firmer surface compared to the soft dry sand. Some beaches have extremely low tides and allow harder surface away from the edge of the water to run and still on packed sand (**Saha, Sukumar, 2008**).

Objectives

This study was designed to investigate influence of flywheel and seashore training packages on selected physiological parameters among college men handball players.

Methodology

To achieve the purpose of the study (N=45) forty five men handball players were selected from SKSS Arts College, Thirupanandal, Tamilnadu, India as subjects. The age of the subjects ranged from 19 to 23 years. The selected subjects were divided into three equal groups (N=15). Group I underwent flywheel training. Group II underwent seashore training. Group III acted as control group who did not undergo any specialized training program other than their daily routine. The physiological parameters such as blood pressure, resting heart rate and breathe holding time were selected as dependent variables and they were assessed by sphygmomanometer, manual pulse check and manual method respectively. The subjects were concerned with their particular training for a period of six weeks, alternatively three days per week. The collected data from three groups prior to and immediately after the training programme on selected criterion variables were statistically analyzed with analysis of covariance (ANCOVA). The level of confidence was fixed at 0.05 for all the cases to test the hypothesis.

Table I: Selected Variables and Their Tests

S.No	Variables	Test	Unit of Measurements
1	Systolic Blood Pressure	Automatic Blood Pressure Monitor	Mm./Hg
2	Diastolic Blood Pressure	Automatic Blood Pressure Monitor	Mm./Hg
3	Resting Heart Rate	Radial Pulse	Beats / Minute
4	Breath Holding Time	Holding the Breath for Time	Seconds

Results

Table 1: Computation of Analysis of Covariance of Means of Flywheel Training and Seashore Training, Blood Pressure, Resting Heart Rate and Breathe Holding Time. (In Seconds, Mm. /Hg and Beats / Minute)

Variables	Test	Flywheel Training (FTG)	Seashore Training (STG)	Control Group (CG)	Source of Variance	Sum of Square	df	Mean Squares	'F' Ratio
Systolic Blood Pressure	Pre Test	112.73	113.27	113.00	Between	2.33	2	0.78	0.03
					Within	1625.60	42	29.02	
	Post Test	109.53	109.26	113.13	Between	342.58	2	114.19	5.08*
					Within	1260.00	42	22.50	
	Adjusted Post Test	109.78	109.06	113.16	Between	356.83	2	118.95	74.31*
					Within	88.04	41	1.60	
Diastolic Blood Pressure	Pre Test	77.53	77.00	75.86	Between	22.53	2	7.51	2.37
					Within	177.20	42	3.16	
	Post Test	74.73	74.60	76.26	Between	101.78	2	33.92	10.49*
					Within	181.07	42	3.23	
	Adjusted Post Test	74.51	74.52	76.50	Between	109.19	2	36.39	11.94*
					Within	167.59	41	3.05	
Resting Heart Rate	Pre Test	69.13	69.33	69.53	Between	2	2	0.67	0.71
					Within	52.40	42	0.94	
	Post Test	66.60	66.00	69.40	Between	132.60	2	44.20	38.20*
					Within	64.80	42	1.16	
	Adjusted Post Test	66.81	66.05	69.29	Between	128.70	2	42.90	76.57*
					Within	30.82	41	0.56	
Breath Holding Time	Pre Test	33.44	33.41	33.37	Between	0.42	2	0.14	1.88
					Within	4.23	42	0.07	
	Post Test	36.86	37.13	33.99	Between	190.62	2	63.54	23.79*
					Within	149.56	42	2.67	
	Adjusted	36.86	37.13	33.97	Between	179.79	2	59.93	

	Post Test				Within	149.47	41	2.71	22.05*
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*Significant at 0.05 level of confidence. (Table value required for significant at 0.05 level of confidence with df (3,56 & 3,55) were 2.77 respectively.

The pre, post-test and adjusted post-test mean values of systolic blood pressure on Fly wheel Training Group (FTG), Seashore Training Group (STG) and Control Group (CG) were 112.73, 109.53, 109.78; 113.27, 109.26, 109.06 and 113.00, 113.13, respectively.

The pre, post-test and adjusted post-test mean values of diastolic blood pressure on Fly wheel Training Group (FTG), Seashore Training Group (STG) and Control Group (CG) were 77.53, 74.73, 74.51; 77.00, 74.60, 74.52 and 75.86, 76.26, 76.50, respectively.

The pre, post-test and adjusted post-test mean values of resting heart rate on Fly wheel Training Group (FTG), Seashore Training Group (STG) and Control Group (CG) were 69.13, 66.60, 66.81; 69.53, 66.00, 66.05 and 69.53, 69.40, 69.29 respectively.

The pre, post-test and adjusted post-test mean values of breathe holding time on Fly wheel Training Group (FTG), Seashore Training Group (STG) and Control Group (CG) were 33.44, 36.86, 36.86; 33.41, 37.13, 37.13; and 33.37, 33.99, 33.97 respectively. The obtained F values of adjusted post-test were greater than the table value of 3.23. Hence it was proved that there were significant improvements on systolic blood pressure, diastolic blood pressure, resting heart rate and breathe holding time of college men handball players.

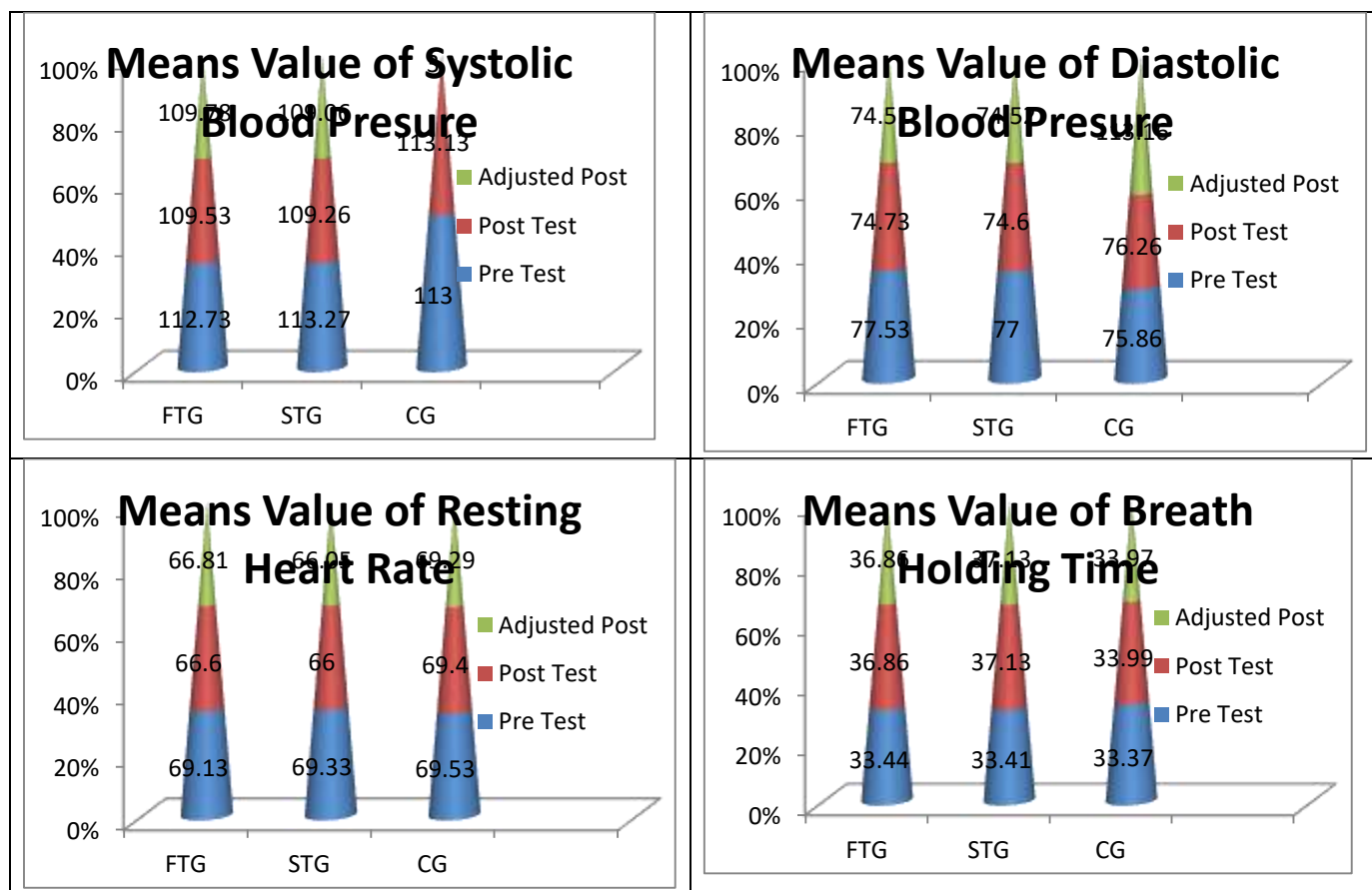


Figure-1: Pre, Post and Adjusted Post Test Means of Flywheel Training and Seashore Training, Blood Pressure, Resting Heart Rate and Breathe Holding Time.

Discussion of Findings

The result of the study indicates that the experimental group namely as flywheel training and seashore training had significantly improved in the selected dependent variables systolic blood pressure, diastolic blood pressure, resting heart rate and breathe holding time improvement caused by flywheel training and seashore training. The results of the studies are in line with the studies of **(Jacob, S. (2010))**.

Conclusions

The experimental groups namely as flywheel training and seashore training had achieved significant improvement on selected the physiological parameters such as systolic blood pressure, diastolic blood pressure, resting heart rate and breathe holding time when compared to control group.

It was concluded that seashore training shown better improvement when comparing to the flywheel training groups on selected the physiological parameters.

It was concluded that college level player should practice both flywheel training and seashore training for positive enhancement of playing.

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