Effect of Circuit Training on Selected Physical Variables among School Football Players

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Abstract

Foot ball is an indigenous game played in a big area and it involves indigenous skilled players. India has established its name and fame in these games. The games are popular at national and international levels. Research in the field of sports and games had proved that variables such as selected physical variables decide the playing ability of an individual. Physical fitness means to share responsibility without undue stress, fatigue and help in the quality of health and wellbeing.

The purpose of the study was to compare the selected physical variables among school football players (boys). To achieve the purpose of this study 30 players were selected from Presidency school, Bangalore as subjects for the study. Their age ranged from 10 to 14 years. The research scholar reviewed the available scientific literature pertaining to the problem understanding from books, journals, magazines, research papers and also falling into considerations the feasibility of criteria and availability of instruments chosen for motor components such as speed, power, weight and flexibility. Apart from that, player should be strong in techniques during the time of game such as speed and movement of the ball, techniques of other players and fundamental skills in order to execute the movement successfully. The result of the study revealed that there was a significant difference observed on flexibility among school football players. Except this all other variables showed insignificant difference among players in all the selected physical variables.

KEYWORDS: Circuit Training, Football, Flexibility, Speed, Power.

INTRODUCTION

Education is dynamic force in the life of every individual, influencing his physical, mental, emotional, social and ethical development. The term education means different things to different individuals. One individual will define it as a training process that comes about through study and instruction.

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into considerations the feasibility of criteria and availability of instruments chosen for motor components such as speed, power, weight and flexibility. Apart from that, player should be strong in techniques during the time of game such as speed and movement of the ball, techniques of other players and fundamental skills in order to execute the movement successfully. The result of the study revealed that there was a significant difference observed on flexibility among school football players. Except this all other variables showed insignificant difference among players in all the selected physical variables.

Advantages of Circuit Training

1. May be easily structured to provide a whole body workout.
2. May not require expensive gym equipment.
3. Participants normally work in small groups, allowing beginners to be guided by more experienced individuals, as well as benefiting from the supervision of the instructor.
4. Can be adapted for any size workout area.
5. Can be customized for specificity; easy to adapt to your sport.

Benefits of Circuit Training

Nowadays, most people don't have time for lengthy, grueling 2-hour workouts, be it with work and family demands or simply the search of free time. Well, what if there was a way to be in and out of the gym in less than 1 hour and still feel absolutely worked? What if you could combine your cardio and weights so that you wouldn't have to spend hours on either? Well, I'm going to let you in on a little secret – it's called Circuit Training – and it is the most effective and time efficient means of exercise for those looking to lose weight and tone.

Physical Variables

Physical fitness means to share responsibility without undue stress, fatigue and help in the quality of health and wellbeing so that the players should have motor components such as speed, power, weight and flexibility. Apart from that player should be sound in technique at the time of play no player speed and movement of the ball and change their technique and fundamental skill in order to execute the movement successfully and it also for the defensive arts skill. Different people have different points of view regarding physical fitness. For a common man a good physique is symbol of physical fitness. In fact physical fitness of a person means the capacity to do the routine work without any fatigue or exertion and after doing his work he has a power to do some more work and recovery is quicker Physical fitness having health plus the capacity to do one's everyday task to engage in recreational pursuits and to meet emergencies when they arise. Physical fitness is used in two close meanings - general fitness (a state of health and well-being) and specific fitness (a task-oriented definition based on the ability to perform specific aspects of sports or occupations.

METHODOLOGY

Methodology presents the procedure adopted for the selection of the subjects, selection of variables, criterion measures, experimental design, research design, reliability of data, reliability of instruments, testers reliability, testers competency, subject reliability, orientation of the subjects, collection of data, experimental training & schedule, test administration, administration of test and statistical procedure are being explained.

Selection of the Subjects

To achieve the purpose of the study, 30 players (boys) were selected from Presidency School, Bangalore. As per their school records their age were 10 yrs to 14 years. The players were selected on a random sampling. The selected subjects were equally divided in to two groups' namely experimental group and control group.

Selection of Variables

The research scholar reviewed the available scientific literatures pertaining to the problem understanding from books, journals, magazines and research papers considering the feasibility of criteria and availability of instruments, and the following variables were selected.

Independent Variables

The following is the independent variables selected for this study

- Circuit training

Dependent Variables

The following is the dependent variables selected for this study

1. **Physical Variables**
   - Muscular strength
   - Muscular endurance
   - Agility
   - Leg explosive power
   - Pulse rate
   - Breath holding time

TABLE-I

SELECTION OF TESTS

S. No.	PhysicalVariables	Tests	Units
1.	Muscular Strength	Push Ups	Counts
2.	Muscular Endurance	Cooper Test	Seconds
3.	Agility	Shuttle Run	Seconds
4	Leg Explosive Power	Standing Broad Jump	In Meters
5	Pulse rate	Pulse monitor	Minutes
6	Breath holding time	Stop watch	Minutes

Collection of Data

At the end of the treatment period, as post-test, the subjects belongs to the groups namely experimental and control group were tested on criterion variables (muscular strength, muscular endurance, agility, leg explosive power, pulse rate and breath holding time as such in the pre-test of the same. The collected data were processed with appropriate statistical tool and the detailed procedure of the same is given below.

Competency of the Tester

Before conducting the test the investigator selected physical education teachers as tester. The purpose of the study and procedure of conducting the test and method of scoring were explained and demonstrated perfectly to obtain maximum reliability.

Instrument Reliability

Stop watches, measuring tape, score sheet, and other equipment's were used to collect the data for this study. They were obtained from standard firms. On all occasions, the measurements showed the same reading and therefore the instruments were proved reliable.

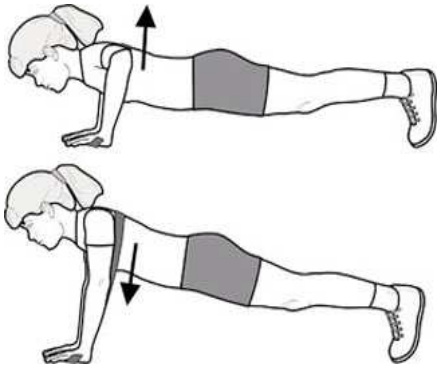
Administration of the Tests

1. Muscular Endurance (12-Minutes Cooper Test)

Purpose:
To measure the Cardio Respiratory Endurance.
Equipment:
Stop watch, whistle, distance mark and 400 mts track were used for group testing.
Procedure:
The subjects were asked to stand behind a line and upon the staring signal the subjects starts running or walking as many laps. As possible around the course for a period of the 12 minutes the spotters maintain a count of each lap and on the signal to stop the subject under the spot where they have reached.
Scoring:
Total distance are covered in meter are recorded as individual scores.

2. Muscular Strength [Push-ups]

Purpose



The Pushup Test measures muscular strength and endurance, a combination that better reflects your fitness level than strength tests like the one rep max. Besides being dangerous, single rep max tests also require a lot of equipment (bench press or squat rack, barbells, and other weights). A timed push-ups test, on the other hand, can be done anywhere.

Procedure:

These are executed from the floor. The chest must touch the floor each term and arms must be fully extended on the return. The back must be kept straight no partial credit his allowed, and the exercise must be done continuously.

Men will assume a traditional pushup position the pushups start, so does the clock! Press yourself up with arms fully extended and lower yourself back until your chest is three inches from the floor (but do not touch your body to the floor). Repeat as many times as you can in one minute you may rest only in the "up" position if necessary.

Scoring:

Maximum more repetition for a full capacity noted in a score sheet high and low subject in order wise.

3. Leg Explosive Power (Standing Broad Jump Test)

Purpose:

To measure the explosive power of the legs.

Description:

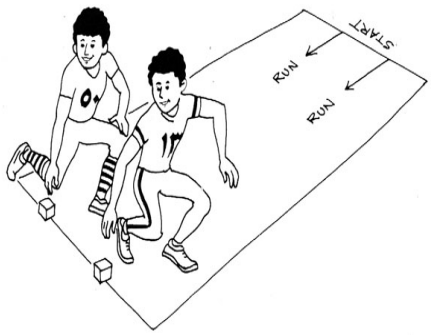
The athlete stands behind a line marked on the ground with feet slightly apart. A two foot take-off and landing is used, with swinging of the arms and bending of the knees to provide forward drive. The subject attempts to jump as far as possible, landing on both feet without falling backwards. Three attempts are allowed.

Scoring:

The measurement is taken from take-off line to the nearest point of contact on the landing (back of the heels). Record the longest distance jumped, the best of three attempts. The table below gives a rating scale for the standing long jump test, for adults.

4. Agility [Shuttle-run test]

Purpose:



This test describes the procedure as used in the President's Challenge Fitness Awards. The variations listed below give other ways to also perform this test. This is a test of speed and agility, which is important in many sports.

Procedure:

This test requires the person to run back and forth between two parallel lines as fast as possible. Set up two lines of

cones 30 feet apart or use line markings, and place two blocks of wood or a similar object behind one of the lines. Starting at the line opposite the blocks, on the signal "Ready? Go!" the participant runs to the other line, picks up a block and returns to place it behind the starting line, then returns to pick up the second block, then runs with it back across the line.

Scoring: Two or more trails may be performed, and the quickest time is recorded. Results are recorded to the nearest tenth of a second.

5.Pulse Rate

Purpose: To record the number of pulse per minute.

Procedure: The pulse rate of all the subjects was recorded in sitting position. The subjects were allowed to relax for is to 20 minutes before taking the pulse rate. To record the pulse rate, the subjects for arm was slightly prorated and the wrist slightly flexed. The tester placed his tips of the fingers compressing the radial artery at the wrist in such a manner that palpitation was felt clearly and the number of palpitation were counted for one minute.

Scoring: Just counted the heart beat for 30 seconds.

6. Breath Holding Time

Purpose: To measure the breath holding time.

Procedure: The subjects stand at ease and inhale deeply after which he hold his breath for a length of time possible for him. The index figure of the respondent serves as a indicator to the research scholar to make known the start and end of the recording time. The thumb and middle figures are used to hold the nose to avoid letting the air by opening the mouth apparently is considered while recording the breath holding time.

Scoring: The breath holding time was recorded with the hope of the stop watch. After a rest of three minutes, another trail was taken. The best time was recorded in seconds as the score.

Training Program

The investigator selected a training that is circuit training for football players which improved certain selected physical fitness variables namely muscular strength, muscular endurance, agility, Leg explosive power and improving resting pulse rate, breath hold time as the result of circuit training the physical fitness level of the football group-I would improve. Keeping the above things in mind the investigator with the consultation of the experts in the field planned the following schedule of training to test the subjects selected for the study.

CIRCUIT TRAINING

1st WEEK TRAINING PROGRAM

Days	Exercises	Time for per exercise	Between set Jogging	No. of sets	Time Duration
MON	6	25	1	3	20
TUE	6	25	1	3	20
WED	6	25	1	3	20
THUR	6	25	1	3	20
FRI	6	25	1	3	20

2nd WEEK TRAINING PROGRAM

Days	Exercises	Time for per exercise	Between set Jogging	No. of sets	Time Duration
MON	6	25	1	3	20
TUE	6	25	1	3	20
WED	6	25	1	3	20
THUR	6	25	1	3	20
FRI	6	25	1	3	20

3rd WEEK TRAINING PROGRAM

Days	Exercises	Time for per exercise	Between set Jogging	No. of sets	Time Duration
MON	9	25	1	4	25
TUE	9	25	1	4	25
WED	9	25	1	4	25
THUR	9	25	1	4	25
FRI	9	25	1	4	25

4TH WEEK TRAINING PROGRAM

Days	Exercises	Time for per exercise	Between set Jogging	No. of sets	Time Duration
MON	9	25	1	4	25
TUE	9	25	1	4	25

WED	9	25	1	4	25
THUR	9	25	1	4	25
FRI	9	25	1	4	25

5TH WEEK TRAINING PROGRAM

Days	Exercises	Time for per exercise	Between set Jogging	No. of sets	Time Duration
MON	12	30	1	5	30
TUE	12	30	1	5	30
WED	12	30	1	5	30
THUR	12	30	1	5	30
FRI	12	30	1	5	30

6TH WEEK TRAINING PROGRAM

Days	Exercises	Time for per exercise	Between set Jogging	No. of sets	Time Duration
MON	12	30	1	5	30
TUE	12	30	1	5	30
WED	12	30	1	5	30
THUR	12	30	1	5	30
FRI	12	30	1	5	30

Statistical Techniques

The data collected from the control group (1) and experimental group (2). The selected variables were statistically examined using the 't' ratio was calculated to find out the significance of the difference between the mean of the initial and final test of the Clarke and state that the 't' ratio is the ratio of the difference between means and standard error of the difference.

The't' ratio is the ratio of the difference between the means and the standard error of the mean. Since equivalent groups were used in this study, the degree of freedom chosen was n-2 as suggested by Garrett.

Analysis and Interpretation of Data

Level Of Significance

To test the significance of 't' values as level of significance 0.05 level was chosen for the required table value for the degrees of freedom. The data collected prior

to and after the training period on muscular endurance, muscular strength, agility, leg explosive power, pulse rate and breath holding time for the experimental group have been analyzed.

TABLE - II

TABLE SHOWING THE MEAN, MEAN DIFFERENCE, STANDARD DEVIATION AND 't' VALUE OF EXPERIMENTAL GROUP AND CONTROL GROUP ON MUSCULAR ENDURANCE

Group	No. of Subjects	Pre-Mean	Post-Mean	Standard Deviation		Std. Error Mean	t-ratio
				Pre	Post		
Experimental Group	15	1646.93	1682.67	146.40	146.62	14.52	2.44*
Control Group	15	1646.33	1650.53	137.83	156.72	14.62	1.28

*Significance at 0.05 level of confidence

An examination of table II show that the obtained mean values of Experimental group pre and post-test mean values were 1646.93 and 1682.67 respectively. In Control group pre and post-test were mean values were 1646.33 and 1650.53 respectively. In experimental the obtained t-ratio 2.44 is greater than the table value 2.02. It is found to be significant. In control group the obtained t-ratio 1.28 is lesser than the table values 2.02 so it is found to be insignificant.

TABLE III

TABLE SHOWING THE MEAN, MEAN DIFFERENCE, STANDARD DEVIATION AND 't' VALUE OF EXPERIMENTAL GROUP AND CONTROL GROUP ON MUSCULAR STRENGTH

Group	No. of Subjects	Pre-Mean	Post-Mean	Standard Deviation		Std. Error Mean	t-ratio
				Pre	Post		
Experimental group	15	20.40	21.07	0.91	0.91	0.09	2.32*
Control group	15	20.75	20.53	1.08	1.00	0.17	1.56

*Significance at 0.05 level of confidence

An examination of table III shows that the obtained mean values of Experimental group pre and post-test mean values were 20.40 and 21.07 respectively. In Control group pre and post-test were mean values were 20.75 and 20.53 respectively. In experimental the obtained t-ratio 2.32 is greater than the table value 2.02. It is found to be significant. In control group the obtained t-ratio 1.56 is lesser than the table values 2.02 so it is found to be insignificant.

TABLE IV

TABLE SHOWING THE MEAN, MEAN DIFFERENCE, STANDARD DEVIATION AND 't' VALUE OF EXPERIMENTAL GROUP AND CONTROL GROUP ON AGILITY

Group	No. of Subjects	Pre-Mean	Post-Mean	Standard Deviation		Std. Error Mean	t-ratio
				Pre	Post		
Experimental group	15	20.87	20.61	0.91	0.91	0.09	1.56
Control group	15	20.75	21.23	1.08	1.00	0.17	2.32

insignificance at 0.05 level of confidence

An examination of table IV shows that the obtained mean values of Experimental group pre and post-test mean values were 20.87 and 20.61 respectively. In Control group pre and post-test were mean values were 20.75 and 21.23 respectively. In experimental the obtained t-ratio 1.56 is lesser than the table value 2.02. It is found to be insignificant. In control group the obtained t-ratio 2.32 is greater than the table values 2.02 so it is found to be significant.

TABLE V

TABLE SHOWING THE MEAN, MEAN DIFFERENCE, STANDARD DEVIATION AND 't' VALUE OF EXPERIMENTAL GROUP AND CONTROL GROUP ON LEG EXPLOSIVE POWER

Group	No. of Subjects	Pre-Mean	Post-Mean	Standard Deviation		Std. Error Mean	t-ratio
				Pre	Post		
Experimental group	15	2.25	2.32	0.99	0.120	.233	2.12*
Control group	15	2.27	2.27	.135	.200	.124	1.66

*Significance at 0.05 level of confidence

An examination of table V shows that the obtained mean values of Experimental group pre and post-test mean values were 2.25 and 2.32 respectively. In Control group pre and post-test were mean values were 2.27 and 2.27 respectively. In experimental the obtained t-ratio 2.12 is greater than the table value 2.02. It is found to be significant. In control group the obtained t-ratio 1.66 is lesser than the table values 2.02 so it is found to be insignificant.

TABLE VI

TABLE SHOWING THE MEAN, MEAN DIFFERENCE, STANDARD DEVIATION AND 't' VALUE OF EXPERIMENTAL GROUP AND CONTROL GROUP ON RESTING HEART RATE

Group	No. of Subjects	Pre-Mean	Post-Mean	Standard Deviation		Std. Error	t-ratio
				Pre	Post		

						Mean	
Experimental Group	15	74.13	72.05	1.36	1.44	0.38	1.39
Control Group	15	73.60	73.87	1.18	1.19	0.45	2.59

Insignificance at 0.05 level of confidence

An examination of table VI shows that the obtained mean values of Experimental group pre and post-test mean values were 2.25 and 2.32 respectively. In Control group pre and post-test were mean values were 2.27 and 2.27 respectively. In experimental the obtained t-ratio 2.12 is greater than the table value 2.02. It is found to be insignificant. In control group the obtained t-ratio 1.66 is lesser than the table values 2.02 so it is found to be significant.

TABLE VII
TABLE SHOWING THE MEAN, MEAN DIFFERENCE, STANDARD DEVIATION AND 't' VALUE OF EXPERIMENTAL GROUP AND CONTROL GROUP ON BREATH HOLDING TIME

Group	No. of Subjects	Pre-Mean	Post-Mean	Standard Deviation		Std. Error Mean	t-ratio
				Pre	Post		
Experimental group	15	25.07	26.87	3.51	3.24	0.19	2.57*
Control group	15	24.20	23.47	3.38	3.26	0.23	1.29

*Significance at 0.05 level of confidence

An examination of table VII shows that the obtained mean values of Experimental group pre and post-test mean values were 25.07 and 27.87 respectively. In Control group pre and post-test were mean values were 26.20 and 23.47 respectively. In experimental the obtained t-ratio 2.57 is greater than the table value 2.02. It is found to be significant. In control group the obtained t-ratio 1.29 is lesser than the table values 2.02 so it is found to be insignificant.

Discussion on Findings

The result of this investigation showed a significant improvement in the subjects of the experimental group after regular practice in muscular endurance, muscular strength, agility, leg explosive power, pulse rate and breath holding time on training.

The result of this study is in line with the hypothesis of the investigation. Interest on the part of the subject used in this study to improve their muscular endurance, muscular strength, agility, leg explosive power, pulse rate and breath holding time might also account for the result and this inference is supported by the further fact that all previous studies of similar nature were conducted on boys players only. The six weeks period for the experimental seems to be not too short a period to produce valid results. But if the

research is carried on for full session or more it would certainly have given better results and might have eliminate many factors which influence the results.

The research was confined to the study of muscular strength and agility only while some of the subjects were good players, otherwise just arrange this difference in the subject of this experimental study warrants influences. It will stand to reason to ester that the better player chosen as subject will show a better improvement in muscular endurance, explosive power, heart rate and breathe holding time.

The degree of improvement in still is very significantly a clear. This study supports the positive manner of the method of training namely effect of circuit training. The result of this study indicated concentration and variables program improve muscular endurance, muscular strength, agility, leg explosive power, pulse rate and breath holding time among school level Football players (Boys). It was recognized that brilliant players had something unique in their own style of play and that those individuals are the once out of the ordinary.

Experimental coaches over the year are known to make statements to effect that the players in developing countries with the short comings they should not be faulted their take of concentration in achieving a higher standard of ability.

CONCLUSIONS

Sports for all have become a very popular slogan all over the world, particularly in sports. It yields optimum physical fitness and positive health for all today's life mostly spends upon science and technology. In such circumstances people was more exercise to deep the body and mind to execute the day today activity efficiently.

The purpose of this study was to investigate the effect of circuit training program on selected physical variables among school level Football players (Boys). Before conducting the pre and post-test, the investigators were given clear demonstration to the subjects for the purpose of the test.The tests conducted were physical variables on muscular endurance, muscular strength, agility and leg explosive power. Training program was given to the students for 6 weeks to investigate the significant difference and development in the effect of circuit training.To find out the significant difference in pre and post-test, the statistical analysis‘t’ ratio was used. The level of significance at 0 0.5 level of confidence.

In the light of the findings of the present study the following conclusions have been drawn:

1. Six weeks practice of circuit training improved the physical variables among school level Football players (Boys).
2. Six weeks practice of circuit training improved the physical variables school level Football players (Boys).

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