



## EFFECT OF TWO METHODS OF CIRCUIT TRAINING COMBINED WITH ASANAS AND PRANAYAMA PRACTICE ON CARDIORESPIRATORY ENDURANCE AND BODY MASS INDEX OF SCHOOL GIRLS

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**Abstract:** The present study was to find out the effect of two methods of circuit training combined with asanas and pranayama practice on cardiorespiratory endurance and body mass index of school girls. The study was formulated as a true random group design, consisting of a pre test and post test. The subjects (n=60) were randomly assigned to three equal groups of twenty school girls in each group. The groups were assigned as Experimental Groups I, II, and control group respectively. Experimental group I was assigned as Continuous Method Circuit Training with Asana and Pranayama Group (CMCTAP), experimental group II was assigned as Interval Method Circuit Training with Asana and Pranayama Group (IMCTAP) and the control group was strictly under control not involving any special training. Pre tests were conducted for all the subjects on Cardio respiratory Endurance and Body Mass Index. The experimental groups participated in their respective training protocols for a period of twelve weeks. After the experimental period, the post tests were conducted on the above said dependent variables for all the three groups. The difference between the initial and final scores on each variable was considered the effect of respective treatments. The effects of CMCTAP, IMCTAP on selected variables were tested through ANCOVA. In all cases 0.05 level was fixed to test the hypothesis.

**Key Words:** Cardio respiratory Endurance and Body Mass Index

### I. INTRODUCTION

Sport plays a very prominent role in the modern society. It is important to individuals, a group, a nation and indeed the world. Throughout the world, sport has a popular appeal among people of all ages and both sexes.

“Much of the attraction of sport comes from the wide variety of experience and feeling that result from participation such as success, failure, exhaustion pain, relief and feeling of belonging. Sport can bring money, glory, status and goodwill. However, sport can also bring tragedy, grief and even death.” (Coakley, Jay J., 1998)

### II. STATEMENT OF THE PROBLEM

The present study was to determine the effect of two methods of circuit training combined with asanas and pranayama practice on cardiorespiratory endurance and body mass index of school girls.

### III. DELIMITATIONS

- 1) To achieve the purpose of the study, sixty (N=60) school girls' students Zilla Parishad High School, NR Pally Panagalur Mandal, Kadappa District, Andrapardesh.
- 2) The age of the subjects will be ranged from 13 to 15 years.
- 3) The subjects will be divided at random into three groups of twenty each (n=20). Group-I will undergo interval method of circuit training combined with asana and pranayama (IMCTAP), Group-II will experience the continuous method of circuit training combined with asana and pranayama, (CMCTAP) and Group III will act as a control group (CG).

- 4) The duration of the training period will be restricted to twelve weeks, and the number of sessions per week will be confined to three alternative days.

#### IV. LIMITATIONS

The following limitations will be considered in our research.

- 1) The previous experience of the subjects in sports and games, which might influence the training and data, will not be considered.
- 2) Psychological factors, food habits, rest period, lifestyle, etc., cannot be controlled.
- 3) The weather conditions such as atmospheric temperature, humidity, and meteorological factors will not be considered during testing and training periods.
- 4) Though the subjects will be motivated verbally, no attempt will be made to differentiate the motivation levels during the period of training and testing

#### V. SELECTION OF SUBJECTS

The present study was designed to find out the effect of two methods of circuit training combined with asanas and pranayama practice on cardiorespiratory endurance and body mass index of school girls

To execute this investigation the research scholar randomly select sixty (N=60) school girls student from Zilla Parishad High School, NR Pally Penagalur Mandal, Kadappa District, Andrapardesh, India, at random as subjects. Their age was between 13 to 15 years. The subjects were randomly divided into three groups and each group consists of twenty subjects. Group one acted as experimental group I and Group two acted as experimental II and group three as control group. Control Group underwent routine activities and care was taken that they should not involve in special exercise programmes. Experimental group I underwent continuous circuit training with asana and pranayama and experimental group II under went interval circuit training with asana and pranayama training for twelve weeks.

The requirements of the experimental procedures, testing as well as exercise schedules were explained to them so as to avoid any ambiguity of the effort required on their part and prior to the administration of the study, the investigator got the individual consent from each subject..

#### VI. SELECTION OF VARIABLES

##### Dependent Variables

1. Cardiorespiratory Endurance
2. Body Mass Index

##### Independent Variables

1. Twelve weeks continuous circuit training with asanas and pranayamas
2. Twelve weeks interval circuit training with asanas and pranayamas

#### VIII. EXPERIMENTAL DESIGN

The study was formulated as a true random group design, consisting of a pre test and post test. The subjects (n=60) were randomly assigned to three equal groups of twenty school girls in each group. The groups were assigned as Experimental Groups I, II, and control group respectively. Experimental group I was assigned as Continuous Method Circuit Training with Asana and Pranayama Group (CMCTAP), experimental group II was assigned as Interval Method Circuit Training with Asana and Pranayama Group (IMCTAP) and the control group was strictly under control not involving any special training. Pre tests were conducted for all the subjects on selected health and skill related fitness variables. The experimental groups participated in their respective training protocols for a period of twelve weeks. After the experimental period, the post tests were conducted on the above said dependent variables for all the three groups. The difference between the initial and final scores on each variable was considered the effect of respective treatments. The effects of CMCTAP, IMCTAP on selected variables were tested through ANCOVA. In all cases 0.05 level was fixed to test the hypothesis.

**Table I**

**Variable and Their Measure**

S.No	PARAMETERS	TEST	UNITS
1	Cardio respiratory endurance (AAHPERD,1975)	9 minutes Run/Walk	Meters
2	Body composition (AAHPERD,1975)	BMI	Percentage

Table II

## Intra Class Correlation Coefficient of Test – Retest Scores

S.No	Variables	Test	Obtained 'r'
1	Cardio respiratory endurance	9 minutes Run/Walk	0.83*
2	Body composition	BMI	0.86*

\* Significant at 0.05 level

## VIII. RESULT ON CARDIO RESPIRATORY ENDURANCE

Table III

## COMPUTATION OF ANALYSIS OF COVARIANCE OF CARDIO RESPIRATORY ENDURANCE

	CMCTAP GROUP	INCTAP GROUP	CONTROL GROUP	SOURCE OF VARIANCE	SUM OF SQUARES	df	MEAN SQUARES	OBTAINED F
Pre Test Mean	1424.25	1337.00	1350.75	Between	88025.83	2	44012.92	0.91
				Within	2770501.50	57	48605.29	
Post Test Mean	1629.25	1551.00	1370.50	Between	704365.83	2	352182.92	7.00*
				Within	2867880.75	57	50313.70	
Adjusted Post Test Mean	1580.83	1581.43	1388.50	Between	492704.17	2	246352.09	22.80*
				Within	605183.77	56	10806.85	
Mean Diff	205.00	214.00	19.75					

CMCTAP: Continuous Method of Circuit Training with Asana and Pranayama

INCTAP: Interval Method of Circuit Training with Asana and Pranayama

Table F-ratio at 0.05 level of confidence for 2 and 57 (df) =3.10, 2 and 56 (df) =3.10.

\*Significant

As shown in Table III, the obtained pre test means on Cardio respiratory endurance on CMCTAP group was 1424.25, INCTAP group was 1337.00 and control group was 1350.75. The obtained pre test F value was 0.91 and the required table F value was 3.10, which proved that there was no significant difference among initial scores of the subjects.

The obtained post test means on Cardio respiratory endurance on CMCTAP group was 1629.25, INCTAP group was 1551.00 and control group was 1370.50. The obtained post test F value was 7.00 and the required table F value was 3.16, which proved that there was no significant difference among post test scores of the subjects.

Taking into consideration of the pre test means and post test means adjusted post test means were determined and analysis of covariance was done and the obtained F value 22.80 was greater than the required value of 3.16 and hence it was accepted that there was significant differences among the treated groups.

Since significant differences were recorded, the results were subjected to post hoc analysis using Scheffe's Confidence Interval test. The results were presented in Table IV.

Table IV

## Scheffe's Confidence Interval Test Scores on Cardio respiratory endurance

MEANS				Required C I
CMCTAP Group	INCTAP Group	Control Group	Mean Difference	
1580.83	1581.43		-0.60	82.51
1580.83		1388.50	192.33*	82.51
	1581.43	1388.50	192.93*	82.51

\* Significant

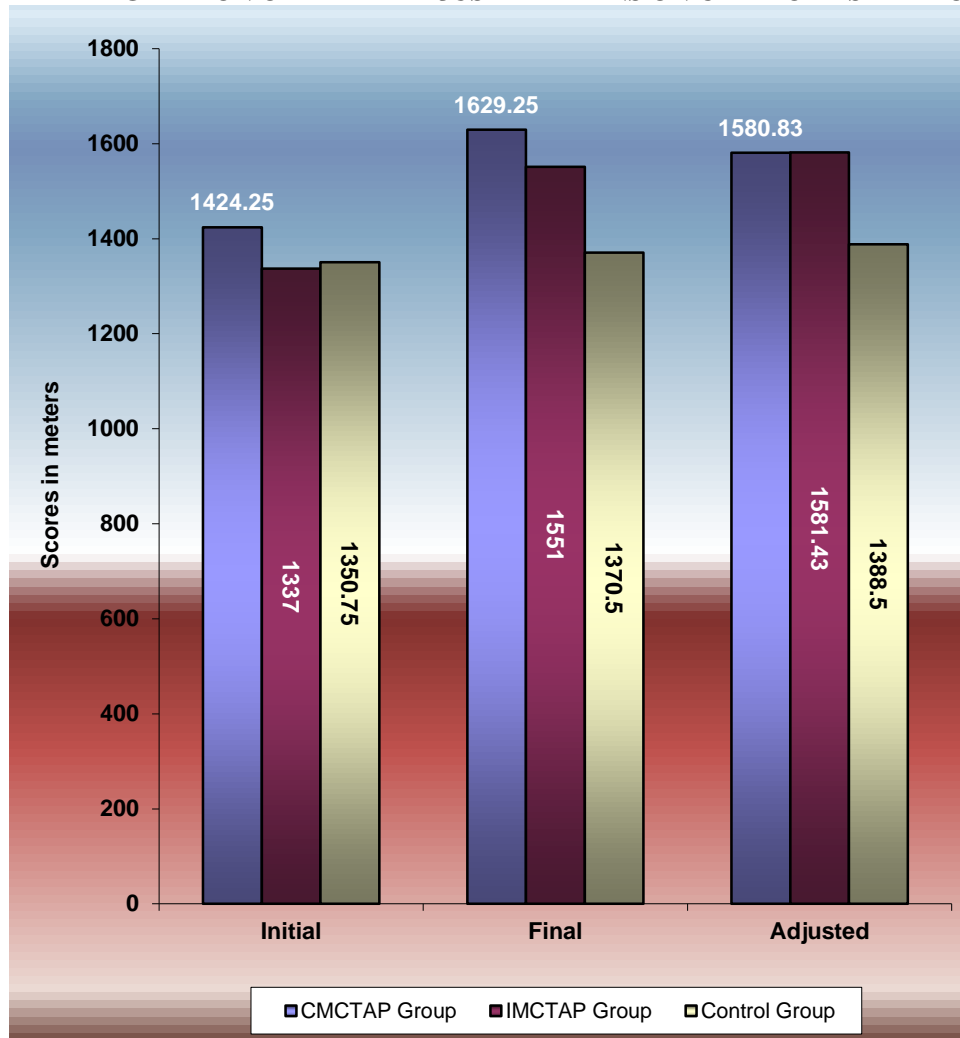
The post hoc analysis of obtained ordered adjusted means proved that there was significant differences existed between CMCTAP group and control group (MD: 192.33). There was significant difference between IMCTAP group and control group (MD: 192.93). There was no significant difference between treatment groups, namely, CMCTAP group and IMCTAP group. (MD: -0.60).

The ordered adjusted means were presented through bar diagram for better understanding of the results of this study in Figure I.



Figure I

## BAR DIAGRAM ON ORDERED ADJUSTED MEANS ON CARDIO RESPIRATORY ENDURANCE



## DISCUSSIONS ON FINDINGS ON CARDIO RESPIRATORY ENDURANCE

The effect of Continuous Method of Circuit Training with Asana and Pranayama (CMCTAP) and Interval Method of Circuit Training with Asana and Pranayama (IMCTAP) on Cardio respiratory endurance is presented in Table III. The analysis of covariance proved that there was significant difference between the experimental group and control group as the obtained F value 22.80 was greater than the required table F value to be significant at 0.05 level.

Since significant F value was obtained, the results were further subjected to post hoc analysis and the results presented in Table IV proved that there was significant difference between CMCTAP group and control group (MD: 192.33) and IMCTAP group and control group (MD: 192.93). Comparing between the treatments groups, it was found that there was no significant difference between CMCTAP and IMCTAP group among school girls.

Thus, it was found that CMCTAP group and IMCTAP group were significantly better than I control group in improving Cardio respiratory endurance of the school girls.

## IX.RESULTS ON BODY MASS INDEX

The statistical analysis comparing the initial and final means of Body mass index due to continuous method of circuit training with asanas and pranayamas (CMCTAP) and interval method of circuit training with asanas and pranayamas (IMCTAP) compared with control group among school girls is presented in Table V

Table V

## COMPUTATION OF ANALYSIS OF COVARIANCE OF BODY MASS INDEX

	CMCTAP GROUP	INCTAP GROUP	CONTROL GROUP	SOURCE OF VARIANCE	SUM OF SQUARES	df	MEAN SQUARES	OBTAINED F
Pre Test Mean	19.75	19.81	19.92	Between	0.29	2	0.145	0.77
				Within	10.706	57	0.188	
Post Test Mean	19.58	19.71	19.92	Between	1.206	2	0.60	4.44*
				Within	7.729	57	0.136	
Adjusted Post Test Mean	19.64	19.73	19.85	Between	0.458	2	0.229	8.88*
				Within	1.444	56	0.026	

Mean Diff	-0.17	-0.10	0.00					
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CMCTAP: Continuous Method of Circuit Training with Asana and Pranayama

INCTAP: Interval Method of Circuit Training with Asana and Pranayama

Table F-ratio at 0.05 level of confidence for 2 and 57 (df) =3.10, 2 and 56 (df) =3.10.

\*Significant

As shown in Table V, the obtained pre test means on Body mass index on CMCTAP group was 19.75, CICTAP group was 19.81 and control group was 19.92. The obtained pre test F value was 0.77 and the required table F value was 3.10, which proved that there was no significant difference among initial scores of the subjects.

The obtained post test means on Body mass index on CMCTAP group was 19.58, IMCTAP group was 19.71 and control group was 19.92. The obtained post test F value was 4.446 and the required table F value was 3.16, which proved that there was no significant difference among post test scores of the subjects.

Taking into consideration of the pre test means and post test means adjusted post test means were determined and analysis of covariance was done and the obtained F value 8.88 was greater than the required value of 3.16 and hence it was accepted that there was significant differences among the treated groups.

Since significant differences were recorded, the results were subjected to post hoc analysis using Scheffe's Confidence Interval test. The results were presented in Table VI.

Table VI

*Scheffe's Confidence Interval Test Scores on Body mass index*

MEANS				Required . C I
CMCTAP Group	IMCTAP Group	Control Group	Mean Difference	
19.64	19.73		-0.09	0.13
19.64		19.85	-0.22*	0.13
	19.73	19.85	-0.13*	0.13

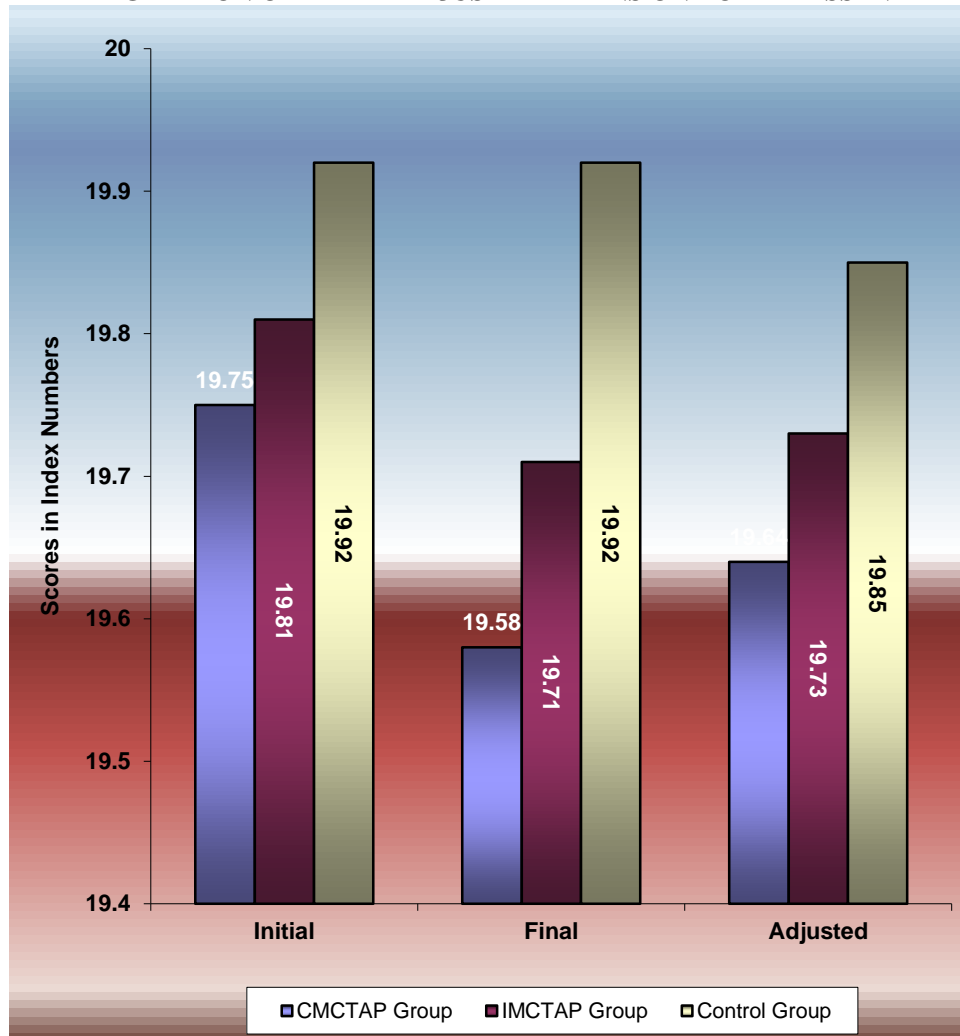
\* Significant

The post hoc analysis of obtained ordered adjusted means proved that there was significant differences existed between CMCTAP group and control group (MD: -0.22). There was significant difference between IMCTAP group and control group (MD: -0.13). There was no significant difference between treatment groups, namely, CMCTAP group and IMCTAP group. (MD: -0.09).

The ordered adjusted means were presented through bar diagram for better understanding of the results of this study in Figure II.

Figure II

## BAR DIAGRAM ON ORDERED ADJUSTED MEANS ON BODY MASS INDEX



## DISCUSSIONS ON FINDINGS ON BODY MASS INDEX

The effect of Continuous Method of Circuit Training with Asana and Pranayama (CMCTAP) and Interval Method of Circuit Training with Asana and Pranayama (IMCTAP) on Body mass index is presented in Table V. The analysis of covariance proved that there was significant difference between the experimental group and control group as the obtained F value 8.88 was greater than the required table F value to be significant at 0.05 level.

Since significant F value was obtained, the results were further subjected to post hoc analysis and the results presented in Table VI proved that there was significant difference between CMCTAP group and control group (MD: -0.22) and IMCTAP group and control group (MD: -0.13). Comparing between the treatments groups, it was found that there was significant difference between CMCTAP and IMCTAP group among school girls.

Thus, it was found that CMCTAP group and IMCTAP group were significantly better than control group in reducing Body mass index of the school girls.

## X.CONCLUSIONS

Within the limitations and delimitations of the study, the following conclusion were drawn.

1. It was concluded that continuous method of circuit training with asana and pranayama and interval of circuit training with asana and pranayama can significantly improve cardio respiratory endurance and bodymass index, of school girls compared to control group.

**XI.REFERENCES**

- Daniel D. Arnheim, (1985) **Modern Principles of Athletic Training** (Saint Louis: Time Mirror / Mosby College Publishing, 1985), P.145.
- David D. Arnheim (1987), **Essential of Athletic Training**, (Saint Louis: Time Mirror / Mosby College Publishing, 1987), P.40.
- Hardayal Singh, (1984) **Sports Training General Theory and Method** (Patiala: Netaji Subas National Institute of Sports, 1984), p. 148.
- Iyengar,B.K.S. (1999) **The Gift of Yoga**, (New Delhi: Harpers Collins Publications India Pvt Ltd., 1999),p.394.
- Keneth Doherty J , (1953) **Modern Track and field** (Englewood Cliffs, N.J. Prentice Hall, Inc., 1953).
- Thomas K. Cureton, (1971) **Physical fitness of Champion 236 Athletes**, (Urbana University of Illinois press, 1951), pp.234-236.
- Yobu, A. (2000), **Test And Measurements In Physical Education** (Chennai: Grace Printers, 2000).
- Atul Sinha, Sony Kumari, and Mollika Ganguly (2021), “Development, validation, and feasibility of a school-based short duration integrated classroom yoga module: A pilot study design”, **J Educ Health Promot.** 2021; 10: 148.
- Australian Council for Health Physical Education and Recreation (1995) **Health Life Styles Journals**, , Vol. 42:4 (Summer, 1995).
- Barbara Csala,Renáta Szemerszky, János Körmendi, Ferenc Köteles, and Szilvia Boros (2021), “Is Weekly Frequency of Yoga Practice Sufficient? Physiological Effects of Hatha Yoga Among Healthy Novice Women”, **Front Public Health.** 2021; 9: 702793.
- Beckhan, Earnest, (2000) “Metabolic Cost of Free Weight Circuit Weight Training”, **Journal of Sports and Physical Fitness**, 40: 2, (June: 2000), P: 118-125.

