

TABATA WORKOUT PROGRAM IMPROVES CARDIOVASCULAR-RELATED HEALTH IN MIDDLE AGED ADULTS

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Abstract

Although numerous sources of evidence show that regular physical activity is beneficial to health, most individuals do not engage in a sufficient amount of physical activity to meet the guidelines set out by expert panels. In addition, the minimum amount of physical activity associated with reduced cardiovascular disease risk markers is not clear in Middle aged adults. The purpose of this study was to determine the effects of a 12-week Tabata program on cardiovascular disease risk markers in middle age adults. The participants were recruited from the following two groups separately: a Tabata(High Intensity Interval Training) group (n=15) and a control group (n=15). In the Tabata group, participants walked 30 to 60 minutes per session on 3 days per week for 12 weeks. Plasma oxidised low-density lipoprotein concentrations tended to be lower than baseline values in the Tabata group after 12 weeks. The ratio of oxidised low-density lipoprotein to high-density lipoprotein cholesterol was significantly

lower than the baseline ratio in the Tabata group after 12 weeks. Resting systolic blood

pressure and diastolic blood pressure were significantly lower than baseline values in the Tabata group after 12 weeks. This findings demonstrate that a 12-week Tabata program confers a benefit to cardiovascular-related health in middle aged adults.

Key words: Tabata, High-intensity interval training (HIIT), Middle aged adults, Plasma oxidised low-density lipoprotein, Resting systolic blood pressure and diastolic blood pressure

1. Introduction

High-intensity interval training (HIIT) programs have become increasingly popular in recent years. "Tabata training," a term that is often used synonymously with HIIT, was first described by the Japanese scientist Izumi Tabata in 1996. Tabata and his colleagues (1996) conducted a study that compared moderate-intensity continuous training at 70% of maximal oxygen consumption (VO₂max) for 60 minutes, with HIIT conducted at 170% of VO₂max. HIIT consisted of eight, 20-second all-out exercise bouts followed by 10 seconds of rest for a total of 4 minutes of exercise. Tabata training has evolved to include a variety of modes and exercises performed in the classic 20-10 pattern (i.e., 20 seconds of all-out effort followed by 10

seconds of rest). While the relative exercise intensity and physiological responses to traditional steady-state exercise are well-documented, there is limited research regarding the relative exercise intensity and energy expenditure of Tabata training.

High-intensity interval training (HIIT), also called high-intensity intermittent exercise (HIIE) or sprint interval training (SIT), is an enhanced form of interval training, an exercise strategy alternating periods of short intense anaerobic exercise with less-intense recovery periods. HIIT is a form of cardiovascular exercise. Usual HIIT sessions may vary from 4–30 minutes. These short, intense workouts provide improved athletic capacity and condition, improved glucose metabolism, and improved fat burning (Perry et al., 2008).

2. Methodology

To achieve the purpose of the study, thirty (N=30) middle aged men from Friends walkers club, Pudukkottai, Tamilnadu India were selected as subjects of this study. The age of the subjects were ranged from 22 to 35 years. The subjects were assigned at random into two groups of fifteen each (n=15). Group-I underwent Tabata workout, and Group-II acted as Control (n=15). Among the various Cardio vascular risk factors only Plasma oxidised low-density lipoprotein concentrations, Resting systolic blood pressure and diastolic blood pressure were selected for this study. The experimental group underwent Tabata workout for 12 weeks. Both the groups were tested on selected criterion variables prior to and immediately after the training periods. Plasma oxidised low-density lipoprotein concentrations was assessed by Blood samples test (Priedwalad's equation Method) and Resting systolic blood pressure and

diastolic blood pressure were assessed by using Sphygmomanometer.

3. Training Protocol

During the training period, the experimental group underwent the following Tabata workout programmes for Monday to Saturday for three days per for twelve weeks duration. The duration of training session in all the days was between thirty and forty five minutes approximately which included warming up and limbering down (Embets, 2013).

Table-1
Exercises for Tabata workout

	Exercises			
Segment-1	High Knee Run	Plank Punch	Jumping Jacks	Sid skaters
Segment-2	Jump Rope	In/out Boat	Line Jumps	Push-ups
Segment-3	Burpees	Russian Twists	Squats	Lunges
Segment-4	Climbers	Push-ups	Split Squat	Box Jumps

- * Each exercise was repeated twice at a ratio of 20 sec exercise/10 sec rest
- * Segment consists of 3 weeks

4. Analysis of the Data

The data collected from the two groups prior to and post experimentation on Cardio vascular risk factors were statistically analyzed by using Analysis of Covariance (ANCOVA). In all the cases 0.05 level of significance was fixed. Plasma Oxidised Low-Density Lipoprotein Concentrations

The Analysis of covariance (ANCOVA) on Plasma oxidised low-density lipoprotein concentrations of experimental group and control group have been analyzed and presented in Table -2.

Table – 2

Analysis of Covariance on Plasma Oxidised Low-Density Lipoprotein Concentrations of Tabata workout group and Control group

Dependent Variables	Adjusted Post-test Means		Source of Variance	Sum of Squares	df	Mean Squares
	Tabata Workout Group (I)	Control Group (II)				
Plasma Oxidised Low-Density Lipoprotein Concentrations (In mg/dL)	116.85	128.55	Between	1025.16	1	1025.16
			Within	613.09	27	22.71

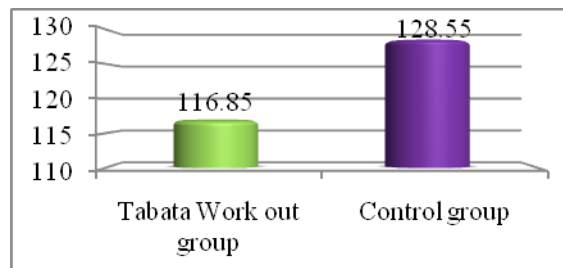


Figure-1:

The adjusted post tests mean values of Tabata workout group and Control group on Plasma Oxidised Low Density Lipoprotein Concentrations (In mg/dL)

Resting Systolic Blood pressure

The Analysis of covariance (ANCOVA) on resting systolic blood pressure of experimental group and control group have been analyzed and presented in Table -3.

Table – 3

Analysis of Covariance on Resting Systolic Blood Pressure of Tabata workout group and Control group

* **Significant at.05 level of confidence**
(The table value required for Significance at .05 level with df 1 and 27 is 4.21)

Table-2 shows that the adjusted post test mean value of Plasma Oxidised Low-Density Lipoprotein Concentrations for Tabata workout group and control group are 116.85 and 128.55 respectively. The obtained F-ratio of 45.15 values of 4.21 for df 1 and 27 required for significance at 0.05 level of confidence.

The results of the study indicate that there are significant differences among the adjusted post test means of experimental group and control group on Plasma Oxidised Low-Density Lipoprotein Concentrations.

The adjusted post test mean values of Tabata workout group and control group on Plasma Oxidised Low-Density Lipoprotein Concentrations are graphically represented in the figure -1.

Dependent Variables	Adjusted Post-test Means		Source of Variance	Sum of Squares	df	Mean Squares	'F' Ratio
	Tabata Workout Group (I)	Control Group (II)					
Resting Systolic Blood Pressure (In mmHg)	129.44	144.43	Between	1681.66	1	1681.66	144.35*
			Within	314.54	27	11.65	

* Significant at.05 level of confidence

(The table value required for Significance at .05 level with df 1 and 27 is 4.21)

Table-3 shows that the adjusted post test mean value of resting systolic blood pressure for Tabata workout group and control group are 129.44 and 144.43 respectively. The obtained F-ratio of 144.35 values of 4.21 for df 1 and 27 required for significance at 0.05 level of confidence.

The results of the study indicate that there are significant differences among the adjusted post test means of experimental group and control group on resting systolic blood pressure.

The adjusted post test mean values of Tabata workout group and control group on resting systolic blood pressure are graphically represented in the figure -2.

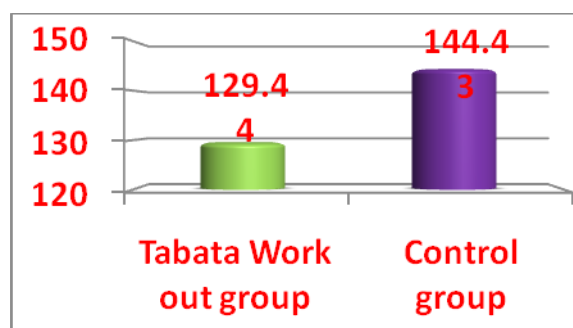


Figure-2:

The adjusted post tests mean values of Tabata workout group and Control group on Resting Systolic Blood Pressure (In mmHg)

Resting Diastolic Blood Pressure

The Analysis of covariance (ANCOVA) on Resting Diastolic Blood Pressure of experimental group and control group have been analyzed and presented in Table -4.

Table – 4

Analysis of Covariance on Resting Diastolic Blood Pressure of Tabata workout group and Control group

Dependent Variables	Adjusted Post-test Means		Source of Variance	Sum of Squares	df	Mean Squares	'F' Ratio
	Tabata Workout Group (I)	Control Group (II)					
Plasma Oxidized Low-Density Lipoprotein Concentrations (In mmHg)	87.81	102.19	Between	1542.32	1	1542.32	51.18*
			Within	813.60	27	30.13	

* Significant at .05 level of confidence
(The table value required for Significance at .05 level with df 1 and 27 is 4.21)

Table-4 shows that the adjusted post test mean value of resting diastolic blood pressure for Tabata workout group and control group are 87.81 and 102.19 respectively. The obtained F-ratio of 51.18 values of 4.21 for df 1 and 27 required for significance at 0.05 level of confidence.

The results of the study indicate that there are significant differences among the adjusted post test means of experimental group and control group on diastolic blood pressure.

The adjusted post test mean values of Tabata workout group and control group on

diastolic blood pressure are graphically represented in the figure -3.

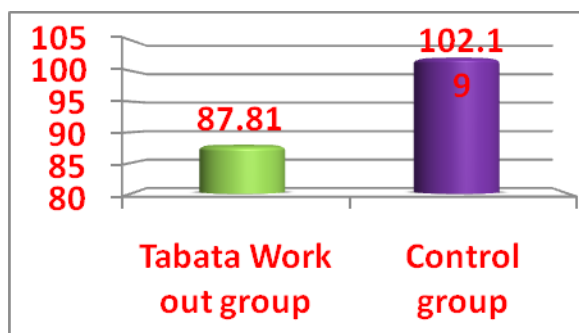


Figure-3:

The adjusted post tests mean values of Tabata workout group and Control group on diastolic blood pressure (In mmHg)

5. Results and Discussion

The results of the study indicate that Tabata workout group had significantly improved in the selected dependent variable such as Plasma oxidised low-density lipoprotein concentrations, Resting systolic blood pressure and diastolic blood pressure. These results are in conformity with the findings of the following studies undertaken by Tran and Weltman (1985), Khave et al, (1988) Karthik & Venkatachalaphy (2011) and Castelli (1992).

6. Conclusion

The experimental group namely, Tabata workout group p had significantly improved in Plasma oxidised low-density lipoprotein concentrations, Resting systolic blood pressure and diastolic blood pressure.

7. References

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