

## **Impact of Tabata Training on Selected Motor Fitness Variables of Handball Players**

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### **Abstract**

The purpose of the present study was to investigate the impact of tabata training on selected motor fitness variables of men handball players. For these purpose forty (N=40) college level men handball players were selected from Chennai, Tamilnadu, India. The age of the subject ranged between 20-25 years. The subjects were randomly divided into two equal groups, experimental group and control group consisting of twenty (n=20) each. Group I underwent tabata training and group II acted as a control, who did not participate any special training. The criterion variable selected were cardio vascular endurance and explosive power. The selected subject were tested on criterion variables at prior to before and after the training period. The paired 't' test and ANCOVA was used to find out the significant differences if any, between the experimental and control group on selected criterion variable. In all the cases, 0.05 level of confidence was fixed to test the significance, which was considered as an appropriate. The difference between the initial and final scores was considered as the effect of respective treatments. The result of the present study reveals that there was significant improvement on selected criterion variables such as cardio vascular endurance and explosive power due to twelve week of tabata training. The control group did not show any significant improvement on the selected motor fitness variables.

**KEYWORDS:** Tabata training, Cardio vascular endurance, Explosive power

### **1. INTRODUCTION**

The training is a process of preparing an individual for any event or an activity or job. Usually in sports use the term sports training which denotes the sense of preparing sports persons for the highest level of performance. But now a days sports training is not just a term but it is very important subject that affects each and every individual who takes up physical activity or sports either for health and fitness or for competition at different level. Hence, sports training is the physical, technical, intellectual, psychological and moral preparation of an athlete or a player by means of physical exercises. (Ajmer Singh, 2014).

The term tabata Formulated in 1996 by a Japanese coach Izumi Tabata this form of fitness training involves high intensity interval training workouts. Commonly known as HIIT. A Tabata workout consists of alternating short periods of intense exercise with short periods of rest for a period of 3 to 4 minutes. It is also a very short workout. Tabata training is attractive because it saves a lot of time for people. It offers the maximum benefit with the least amount of time used to get those results. A wide variety of exercises are compatible with the Tabata protocol, including resistance exercises such as lifting

weights and aerobic exercises such as running or rowing. (**Roger hall, 2015**). Tabata falls under the category of high intensity training or high intensity interval training (HIIT). Any exercise can be incorporated into the Tabata training (air squats, push-ups and pull-ups are the most popular). The basic outline of the Tabata training method is: 20 seconds of intense training (max effort/max reps) with 10 seconds of rest for a total of 4-8 sessions or rounds. (**Izumi Tabata 1995**).

Research efforts to increase physical activity and help to improve the performance of the players. While many interventions have been short-term and some have methodological shortcomings (e.g. small sample size), it is beneficial to review the findings of previous work to guide future research and practice. **Izumi Tabata et al., (1996)**, conducted a study on effects of moderate-intensity endurance and high-intensity intermittent training on anaerobic capacity and VO<sub>2</sub>max. The result of the study showed that moderate-intensity aerobic training that improves the maximal aerobic power does not change anaerobic capacity and that adequate high-intensity intermittent training may improve both anaerobic and aerobic energy supplying systems significantly. A similar approach was taken by **A. Sumpena et al., (2017)**, conducted a study on the impact of tabata protocol to increase the anaerobic and aerobic capacity. The result of the study showed that tabata protocol training may improve both anaerobic and aerobic capacity of the selected subjects. These studies provide evidence that, with some supervision and encouragement, the selected subject engaged in tabata training programs. Research work conducted by **C Kotzamanidis et al., (2005)**, determined the effect of combined high intensity strength and speed training program on the running and jumping ability of soccer players and found combined resistance training and running speed programme provides better improvement on power performance of soccer players.

## 2. MATERIALS AND METHODS

### 2.1 Subjects

To achieve the purpose, forty (N=40) men handball players were purposively selected from Chennai district, Tamilnadu, India. The age of these subjects range between 20 to 25 years, the selected subjects gave willingness to participate in this study. The selected subjects equally divided into two groups. Group I (Tabata training group, n=20) and Group II (Control group, n=20).

### 2.2 Variables and test

Cooper 12 minute run or walk test was using to measured cardio vascular endurance and explosive power was measured using standing broad jump test.

### 2.3 Training intervention

Tabata training was given for 3 days per week (Monday-Morning (6.30 to 8.00 am, Wednesday-Morning (6.30 to 8.00 am), Friday-Morning (6.30 to 8.00 am) for period of twelve weeks. Tabata training would be consist 20 second duration of exercise and 10 second rest between exercises. It consist of 1 minute rest between sets and total of 4 sets. The initial intensity was fixed at 75% and 5 % rule was applied to increase intensity in every three weeks. . The training session includes warming up and warming down period.

## 2.4 Statistical analysis

Descriptive statistics were derived for all test variables using SPSS (16). Changes in cardiovascular endurance and explosive power, and the difference between the groups were assessed by using paired 't' test and ANCOVA. The level of confidence was fixed at 0.05 to test the significance.

## 3. RESULTS AND DISCUSSION

**Table I**  
**Descriptive Statistics and 't' value on Cardio vascular endurance and Explosive power of Experimental Group**

VLBS	Test	Mean	SD	Variance	Skewnes	Kurtosis	't' value	Sig.
CRVE	Pretest	2616.50	132.36	17518.18	-.030	-1.106	13.31*	.00
	post test	2705.50	131.33	172547	-.029	-1.083		
EX PWR	Pretest	2.03	.16	.03	-.583	-.307	8.06*	.00
	Post test	2.13	.14	.02	-1.04	-1.190		

Table 1 shows that descriptive statistics and t value of the experimental group. In the case of cardio vascular endurance pre and post test scores 2616.50 and 2705.50 respectively. The pretest SD value was 132.36 and post test value is 131.33. The pre and post-test means of the explosive power are 2.03 and 2.13 respectively. The pre and post-test SD values are .03 and .02 respectively. The 't' value of cardio vascular endurance and explosive power of the experimental group was 13.31\* and 8.06\* respectively, which was greater than the required table value 2.09 with DF 19, it was found to be statistically significant at 0.05 level of confidence.

**Table II**  
**Descriptive Statistics and 't' value on Cardio vascular endurance And Explosive power of Control Group**

VLBS	Test	Mean	SD	Variance	Skewnes	Kurtosis	't' value	Sig.
CRVE	Pre	2655.50	108.65	11804.99	-.485	-.357	1.84	.812
	Post	2665.50	113.85	12963.16	-.627	-.132		
EX PWR	Pre	2.01	0.12	.04	-.443	-.403	1.55	.137
	Post	2.02	0.19	.04	-.389	-.389		

Table 2 shows that descriptive statistics and t value of the control group. The pre and post-test means of the cardio vascular endurance were 2655.50 and 2665.50 respectively. The pre and post-test SD value is 108.65 and 113.85 respectively. The pre and post-test means of the explosive power were 2.01 and 2.02 respectively. The pre and post-test SD values were 0.12 and 0.19 respectively. The 't' value of cardio vascular endurance and explosive power of the control group is 1.84 and 1.55 respectively, which is lesser than the required table value 2.09 with DF 19, it was found to be no statistically significant at 0.05 level of confidence.

**Table III**  
**Adjusted Post Test Scores on Cardio vascular endurance and**  
**Explosive power of Experimental and Control Group**

Variables	Experimental group	Control group	Mean difference	Std error	sig	95%confidence interval for difference	
						Low bound	Upper Bound
Cardio vascular endurance	2724.82	2645.70	79.12	8.66	.00	61.59	96.69
Explosive power	2.12	2.03	0.09	0.01	.00	0.07	0.12

Adjustment for multiple comparisons: least significant difference (equivalent to no adjustments). The above table of comparison of post adjusted group mean for the experimental and control group for cardio vascular endurance and explosive power indicates that, significant difference between the experimental and control group. Control group showed significantly lower value as compared to experimental group.

#### 4. DISCUSSIONS

The experimental treatment was well followed by the subjects and the results presented in Tables I, II and III proved that as result of tabata training for 12 weeks, the motor fitness variables cardio vascular endurance and explosive power were improved significantly compared to control group. The improvement was found to be significant at 0.05 level.

The findings of this study were in agreement with the findings of I. Tabata, K. Nishimura, M. Kouzaki, Y. Hirai, F. Ogita, M. Miyachi & K. Yamamoto (1996) also found high intensity intermittent training improved aerobic and anaerobic fitness. A. Sumpena & D. Z. Sidik. (2017) determined the effect of tabata protocol to increase the anaerobic and aerobic capacity of futsal players. Carl Foster, Courtney V. Farland, Flavia Guidotti, Michelle Harbin, Brianna Roberts 1, Jeff Schuette, Andrew Tuuri, Scott T. Doberstein and John P. Porcari (2015) who used high intensity interval training vs steady state training to increase the cardio vascular endurance of untrained college aged men. Baker D (2001), investigated in five studies on the training of high intensity muscle power in rugby league players were investigated in five studies. The studies were found high intensity training improve explosive power of the rugby league football players.

Due to the implementation of Tabata training gave an impact towards the improvement of cardio vascular endurance and explosive power. So the protocol suggested that every coaches and physical education teachers to design the training programme to help to increase the performance of handball players.

## 5. Conclusions

1. There was a significant improvement on cardio vascular endurance of the handball players due to twelve weeks of tabata training.
2. There was a significant improvement on explosive power of the handball players due to twelve weeks of tabata training.
3. The control group did not show any significant improvement on cardio vascular endurance and explosive power.

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