

Effect of Tabata Training Program in Improving Maximal Oxygen Consumption among College Women Kabaddi Players

L.Ilavarasi^{1*}, Dr. K.Chandrasekaran², Dr. C.Ramesh³

¹Ph.D., Research Scholar [Full-Time], Department of Physical Education, Madurai Kamaraj University, Madurai Tamilnadu, India.

²Professor & Head [Retd], Department of Physical Education, Madurai Kamaraj University, Madurai, India.

³Assistant Professor & Head, Department of Physical Education, Madurai Kamaraj University, Madurai, Tamilnadu, India.

[Cite this paper as:](#) L.Ilavarasi, Dr. K.Chandrasekaran, Dr. C.Ramesh, (2025) Effect of Tabata Training Program in Improving Maximal Oxygen Consumption among College Women Kabaddi Players. *Journal of Neonatal Surgery*, 14 (29s), 485-489.

ABSTRACT

The study aimed to experiment the effect of tabata training on maximal oxygen consumption among college women kabaddi players. The experimental group was divided into two subgroups after the initial screening for selection criteria, such as tabata training, and the control group, which was not subjected to any experimental training other than their ordinary everyday activities. In this study, college women kabaddi players in the Madurai Kamarajar University affiliated colleges were tested using a pretest and posttest design, as well as a control group. A total of 30 kabaddi players who represented their college team were enlisted and divided into two groups: experiment [15 players] and control [15 players]. The level of vo2 max in both groups was assessed and documented using the Beep Test. ANCOVA with a post-hoc test was used. The threshold of significance 0.05 was chosen to examine the acquired results on variables and was deemed sufficient for the investigation. In conclusion, tabata training is an effective method for enhancing college women kabaddi players' VO₂ max.

Keywords: Tabata Training, Vo2 max, College Women, Kabaddi.

1. INTRODUCTION

The main goal of every athlete is to reach the highest peak of achievement or become the first champion in every sporting event. However, one of the most supportive factors to become a champion in every match is an excellent physical condition, for that it takes the proper training according to the target, to improve the components of physical condition. Tabata is a type of HIIT-one subsection under the broad umbrella of high-intensity interval training. Specifically, it's a four-minute workout consisting of 8 rounds of 20 seconds of work at maximum effort, followed by 10 seconds of rest [5]. High intensity interval training, in its various forms, is today one of the most effective means of improving cardiorespiratory and metabolic function and, in turn, physical sports performance. HIIT involves repeated short to long bouts of fairly high-intensity exercise interspersed with recovery periods. The HIIT method, which uses a short intervention time with vigorous-intensity exercise, may offer a solution [18]. Tabata training, as a form of HIIT, is getting more and more popular these days. Based on interval training offers metabolic booster that causes major benefits for reducing body fat storage. Tabata is a HIIT, which was patented by researcher Izumi Tabata in 1996 [6]. High intensity interval training with Tabata training protocol aimed to improve aerobic and anaerobic efficiency, strengthen the ligamentous and muscular system, and improve resting metabolism.

Sumpena [15] explains that the Tabata Training method is a method that utilizes the ratio of exercise and rest. As for implementing this training method, the details are 20 seconds of exercise activity and 10 seconds of rest, which is repeated until the 4 minutes has run out for one type of movement. Meanwhile, Embert [7] states that by practising using the Tabata Training method, it is highly recommended to do it 2-3 times a week with a gap of 48 hours to 72 hours between sessions. Therefore, Tabata training is a method that is expected to impact increasing anaerobic and aerobic abilities significantly and significantly reduce fat levels in the human body. In addition to Tabata training, other exercises can improve maximum physical condition, namely high-intensity interval training. According to their research [12,5], training based on High-Intensity Interval Training conducted 2 to 3 sessions per week showed an improvement in the performance of running athletes due to increased endurance and VO₂max. High-Intensity Interval Training can improve the heart's performance, which has an impact on the body's metabolism, which also increases sharply.

According to Sheykhlovanda et al. [14], a 3-week low-volume High-Intensity Interval Training approximately 6 to 9 minutes per session was associated with increases in VO₂Max, VO₂ Max volume, and percentage VO₂ Max. According to

Miramonti et al. [11], within four weeks, High-Intensity Interval Training can increase Physical Working Capacity at Fatigue Threshold or physical performance capacity at one's fatigue threshold. Another advantage of High-Intensity Interval Training is that, in addition to increasing fat burning, High-Intensity Interval Training can maintain muscle mass so that muscle is not lost along with burning fat. High-Intensity Interval Training is very suitable for those who are running a cutting fitness program.

Every sports activity needs specific types of physical fitness but in this view, the development of physical fitness should not be ignored because specific fitness depends on general fitness. Every sports activity needs a certain movement procedure to tackle a particular task which refers to the technique when this technique is learned and perfect it is called a skill [8]. Kabaddi is a true people's game since it uses the straightforward Tag Game-style method of a game played only via physical contact. There is no need for a costume, expensive equipment, or a club reservation. With its emphasis on "Cant holding," a unique aspect of Kabaddi, the sport promotes the development of physical strength, stamina, and endurance and also increases cardiovascular endurance and resistance [10,8]. Short-term high-intensity interval training protocols incorporated into physical education lessons are one possible solution to this problem [17]. Therefore, this study aimed to experiment the effect of tabata training on maximal oxygen consumption among college women kabaddi players.

2. MATERIAL AND METHODS EXPERIMENTAL DESIGN

The experimental group was divided into two subgroups after the initial screening for selection criteria, such as tabata training, and the control group, which was not subjected to any experimental training other than their ordinary everyday activities [9]. In this study, college women kabaddi players in the Madurai Kamarajar University affiliated colleges were tested using a pretest and posttest design, as well as a control group. A total of 30 kabaddi players who represented their college team were enlisted and divided into two groups: experiment [15 players] and control [15 players].

Tabata Training Programs

The tabata training program was implemented and supervised by the investigator and with the help of sports trainers from Madurai Kamarajar University, Madurai. Each participant was carefully monitored to ensure the proper execution of the tabata training program. The training was conducted with a moderate intensity [60-70 % of HRmax]. Each session lasted for 60 minutes and was held three times a week [Tuesday, Thursday, and Saturday] over twelve weeks. Exercise intensity was based on HRmax, calculated as 200 minus the participant's age [1,7,13].

Data Collection

The level of vo2 max in both groups was assessed and documented using the Beep Test. The kabaddi players in the experiment group participated in 12-week training sessions, while the youngsters in the control group did not get any treatment. To compare groups, the data were examined using analysis of covariance [2].

Statistical Analysis

ANCOVA [10,2] with a post-hoc test was used. The threshold of significance 0.05 was chosen to examine the acquired results on variables and was deemed sufficient for the investigation.

3. RESULTS

Table 1. Descriptive Statistics

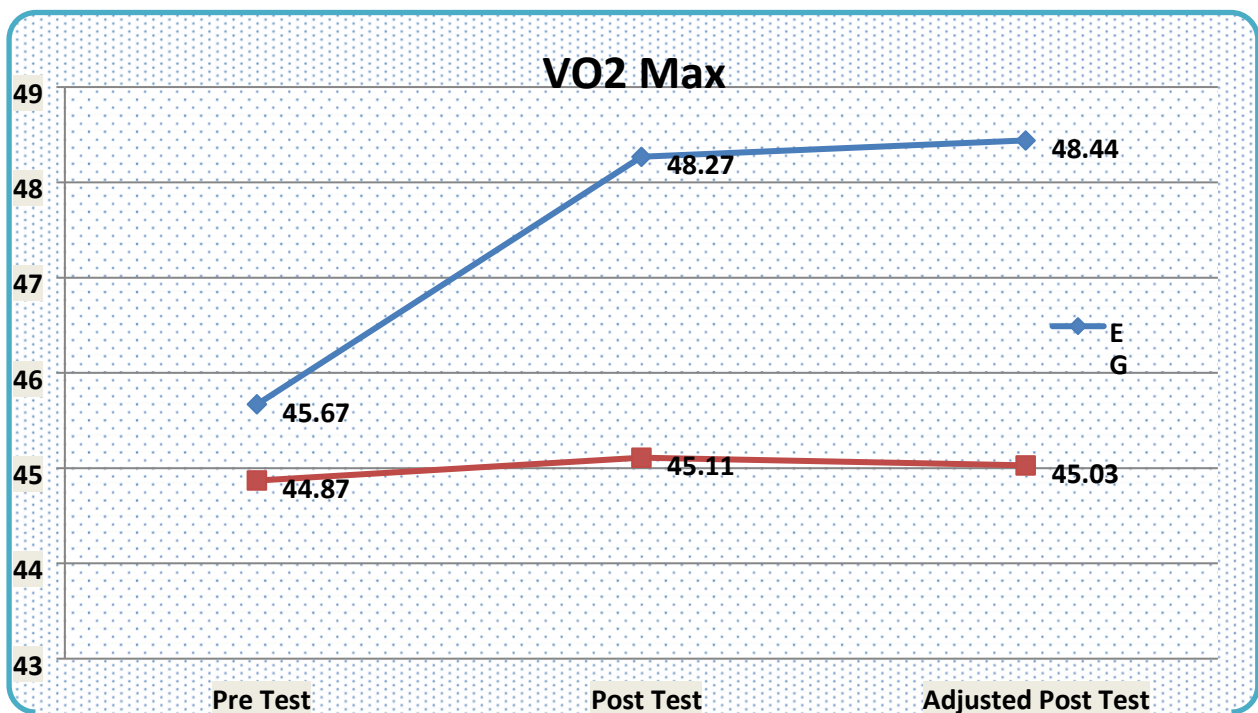
Group	Test	Mean	SD
Experimental	Pre Test	45.67	3.19
	Post Test	48.27	3.34
	Adjusted Post Test	48.44	--
Control	Pre Test	44.87	3.39
	Post Test	45.11	4.01
	Adjusted Post Test	45.03	--

It is obvious that the players in the experiment group improved their vo2 max much more than the players in the control group in the posttest.

Table 2. ANCOVA design on VO₂ max

Source of Variance		Sum of Squares	df	Mean Square	F
Pre Test Mean	BG	0.02	1	0.02	0.88
	WG	0.63	28	0.02	
Post Test Mean	BG	1.98	1	1.98	115.50*
	WG	0.48	28	0.01	
Adjusted Post Mean	BG	1.93	1	1.93	106.34*
	WG	0.49	27	0.01	

There was a significant difference in vo2 max [$F[1,27]=106.34$, $p=0.003$] between the experimental and control groups.

Figure 1. Graphical representations on vo2 max

4. DISCUSSION

The present study revealed that Tabata Training improved the maximal oxygen consumption of the experimental group. As seen in the results of the study, the tabata training intervention was able to greatly improve vo2 max, which is consistent with the findings of other studies. [3,4,14]. According to Karuppaiah, M., & Kumar [10] Kabaddi performance has high progressed over the past few years. Performance levels unimaginable before are now common place, and the number of kabaddi players are capable of outstanding results is increasing. One factor is that kabaddi is a challenging game and group game. Coaching has become more sophisticated, partially from the assistant of sports specialists and scientists. Kabaddi is unlike any other team sport since it requires no special equipment and involves a breath-holding act that strengthens the brain. Metabolism is concerned with the body's ability to convert fat into energy. In addition to increasing metabolism during exercise, it also increases so that the body remains in a condition of burning fat in a resting state. In line with that, High-Intensity Interval Training is very effective in improving one's VO2Max capacity [4].

The first study of Tabata training using, six weeks of TT was found to increase the maximal accumulated oxygen deficit.

This training consisted of 4 days/week of exhaustive TT exercises [7–8 sets to exhaustion] and 1 day/week of 30 min of continuous exercise at 70% VO₂max and four subsequent sets of the TT protocol, which was not exhaustive [16]. Many previous studies have demonstrated the contribution of athletes to the development of aerobic and anaerobic capacity. The TT methods used in these studies were examined according to time, repetition, set and movement characteristics and the developments in the athletes were evaluated [16,17]. Similar to the present study results, it was revealed in some previous studies [1] that Tabata training sessions did produce a significant improvement in the cardiometabolic activities.

5. CONCLUSION

In conclusion, tabata training is an effective method for enhancing college women kabaddi players' VO₂ max. The significant improvements in VO₂ max demonstrate the comprehensive benefits of this training approach. While the study's limitations should be addressed in future research, the findings provide valuable insights into applying TT in sports conditioning. By incorporating such training regimens, coaches and athletes can achieve significant advancements in cardio respiratory capabilities, ultimately leading to better performance in competitive settings.

Conflict of Interest

The authors declare that they have no conflicts interests.

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