



## Effect of Tabata and Sports Vision Training on Selected Biomotor Ability, Neuro psychological and Skill Performance Parameters among Men Football Players

Mr. Konark Roy<sup>1\*</sup>, Dr. Laishram Shila Devi<sup>2</sup>

<sup>1\*</sup> Ph.D. Scholar, Faculty of Physical education and Yoga, ICFAI University, Tripura, India. Konark.

<sup>2</sup> Assistant Professor, Faculty of Physical education and Yoga, ICFAI University, Tripura, India.

\*Corresponding Author: Mr. Konark Roy

\*Ph.D. Scholar, Faculty of Physical education and Yoga, ICFAI University, Tripura, India.

### KEYWORDS

Tabata training;  
Sports vision training;  
Football;  
Bio motor ability;  
Neuropsychology;  
Soccer skills;  
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### ABSTRACT

This study examined the effects of Tabata and sports vision training on selected bio motor ability, neuropsychological and skill performance parameters among men football player. The age levels of the subjects were ranged from 18-25 years. The players were divided into three equal groups: Tabata training, sports vision training, and control group. The Tabata and sports vision training groups underwent their respective training regimens for six weeks. The following tests were conducted on all subjects before and after the training. Results of the study indicated that six weeks of Tabata training and Sports Vision training led to significant improvements in Bio motor ability, neuropsychological, and skill performance parameter among men football players. Furthermore, Tabata training evidenced more effective in bio motor ability when compared to Sport Vision training group. Based on the results of the study the investigator recommends that similar research can be conducted for a different sport, age, and gender

### INTRODUCTION

Football is one of the most popular and competitive sports in the world, requiring high levels of fitness, technical skills, tactics, and mental abilities (Reilly et al., 2000). Football game performance depends on various physical, physiological, psychological, technical, and tactical factors (Sporis et al., 2010). High intensity intermittent activities such as sprinting, kicking, tackling, turning, and rapid acceleration and deceleration are integral to successful football performance (Little & Williams, 2007). Therefore, optimizing physical fitness elements like muscular power, muscular endurance, speed, agility, and cardiovascular endurance is essential for players to effectively carry out football-specific skills during training and matches (Arnason et al., 2004).

In recent years, different innovative conditioning protocols have been experimented to enhance fitness parameters critical for football. One such protocol that

has become popular is the Tabata regimen developed by the Japanese scientist Dr. Izumi Tabata in 1996. Tabata training is an advanced form of high intensity interval training consisting of 8 sets of intense 20 second exercise bursts followed by 10 seconds of rest, completed within 4 minutes (Tabata et al., 1996). Studies have shown Tabata protocol to significantly improve both aerobic and anaerobic capacities along with maximal oxygen consumption in trained athletes (Olson, 2014).

In addition to physical conditioning, development of perceptual-cognitive skills is also vital for achieving football excellence. Key perceptual-cognitive abilities in football include anticipation, pattern recall, decision making, reaction time and processing speed (Vänttinen, 2013). Sports vision training has been often utilized to sharpen the visual and sensory capabilities of athletes related to these skills. Such training aims to enhance visual attributes like visual acuity; peripheral vision;



depth perception; visual reaction time; hand-eye coordination; and ability to judge speed, distance and trajectory of moving objects (Hitzeman & Beckerman, 1993).

## METHODOLOGY

The participants were 60 men football players from Holy cross college, Agartala, ICFAI university, Tripura. The Age levels of the subjects were ranged between 18-25 years. They were divided randomly into three equal groups of 20 players each. Group I (Tabata Training) Group II (Sports Vision Training) Group III (Control) group. The two experimental groups underwent their respective training programs for 6 weeks, 5 days per week alongside their regular football skill practices. The daily training duration was 60 minutes per session. Group I was subjected to the

Tabata protocol featuring high intensity interval exercises. They performed a warm up for 10 minutes followed by eight 20 seconds high intensity work periods interspersed by 10 seconds passive recovery between work periods. Multiple bodyweight and core strengthening exercises involving large muscle groups were included in each session. The sports vision training for Group II encompassed various light-to-moderate intensity drills and conditioning activities focused on enhancing visual abilities crucial for football. The major drills were saccadic eye tracking, near-far focusing, peripheral awareness, visual reaction and anticipation training. Daily training volume was matched between the groups by adjusting work-to-rest ratios. Control group did not participated to any activities except their daily routines.

## RESULT AND FINDINGS ON BIO MOTOR ABILITY

**Table I. Computation of analysis of co-variance on Bio Motor Ability**

TEST	CG	Tabata	Sports vision training	SV	SS	Df	MS	F	p-value
Pre-Test Mean	277.00	1300.00	802.38	Between	5.31	2	2.15	65.46	.090
				Within	2.05	59	4.44		
Post-Test Mean	274.00	1009.52	638.10	Between	10.4	2	5.20	116.76	.000
				Within	2.09	59	4.10		
Adjusted Mean	272.00	1009.52	638.10	Between	10.4	2	5.40	116.76	.000
				Within	2.09	59	4.10		

“Note: SV: Source of Variable, SS: Sum of Square, MS: Mean Square, df: degree of freedom, CG: Control Group, Tabata, and Sports Vision Training.

The Table 1 shows that the adjusted post-test means of CG, Tabata, and Sports Vision Training are 274, 1009.52, and 638.10, respectively. The obtained ‘F’ ratio of 116.7 for the adjusted post-test means is more than the table value of 3.23 for df 2 and 59 required for significance at 0.05 level of confidence on biomotor ability.

The result of the study indicated that there was a significant difference between adjusted post-test means of CG, Tabata, and Sport Vision Training group on biomotor ability.

Since, three groups were compared, whenever the obtained ‘F’ ratio for adjusted post-test was found to be significant, the Scheffe’s test to find out the paired mean difference and it was presented in table II.

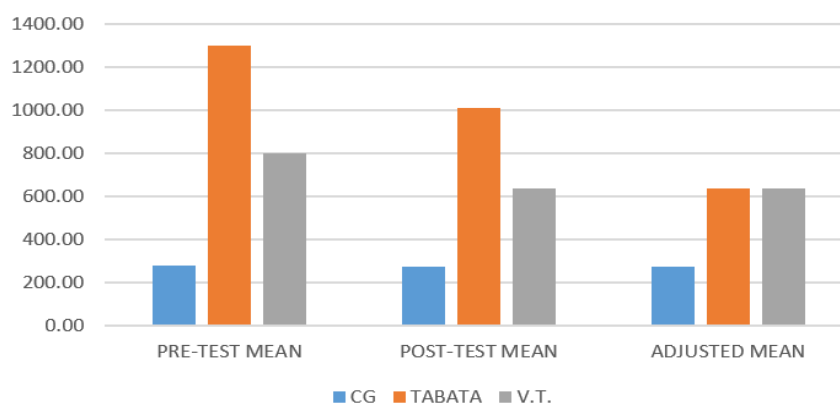
**Table II Scheffe’s Post Hoc Analysis for the differences between the adjusted post-test means on Bio Motor Ability**

Adjusted Post-Test Means			MD	CI
TABATA	SPORTS VISION T	CG		
1009.52	638		371.52	2.124
1009.52		274	735.52	
	638	274	364	



The table II shows that the mean difference values between CG, Tabata, and Sports Vision Training 735.52 and 364 respectively on biomotor ability which

were greater than the required confidence interval value 2.124 for significance.



**Fig. 1: Graphical Illustration of Pre Test, Post Test and Adjusted Post Test Mean of CG, Tabata and sports vision training on Bio motor Ability**

## RESULT AND FINDINGS ON NEUROPSYCHOLOGICAL PARAMETER

**Table III Computation of analysis of co-variance on Neuropsychological parameter**

TEST	CG	Tabata	Sports vision training	SV	SS	Df	MS	F	p-value
Pre-Test Mean	1.0030	0.9971	1.0195	Between	0.006	2	0.003	0.178	.925
				Within	2.125	59	0.036		
Post-Test Mean	1.0838	0.9805	1.0213	Between	0.004	2	0.002	4.20	.030
				Within	1.668	59	0.028		
Adjusted Mean	1.0838	0.9805	1.0213	Between	0.003	2	0.002	4.30	0.020
				Within	1.668	59	0.026		

Note: SV: Source of Variable, SS: Sum of Square, MS: Mean Square, df: degree of freedom, CG: Control Group, Tabata, and Sports Vision Training.

The Table III shows that the adjusted post-test means of CG, Tabata, and Sports Vision Training are 1.0838, 0.9805, and 1.0213, respectively. The obtained 'F' ratio of 4.30 for the adjusted post-test means is more than the table value of 3.23 for df 2 and 59 required for significance at 0.05 level of confidence on Neuropsychological parameter. The result of the study

indicated that there was a significant difference between adjusted post-test means of CG, Tabata, and Sport Vision Training group on Neuropsychological parameter. Since, three groups were compared, whenever the obtained ratio for adjusted post-test was found to be significant, the Scheffe's test to find out the paired mean difference and it was presented in table II.

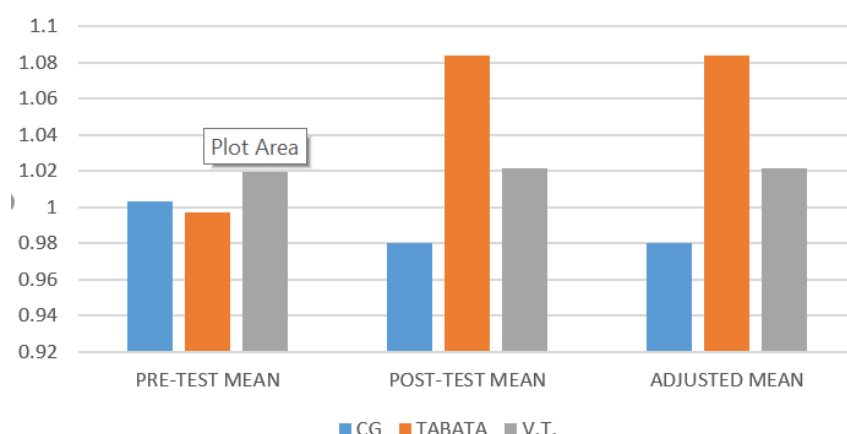
**Table IV Scheffe's post hoc analysis for the differences between the adjusted post-test mean on Neuropsychological parameter**

Adjusted Post-Test Means			MD	CI
Tabata	Sports vision training	CG		
1.0838	0.9976		0.0862	0.101
1.0838		0.9805	0.1033	
	0.9976	0.9805	0.0171	



Table IV shows that the mean difference values between CG and Tabata 0.1033 and 0.0171 respectively on Neuropsychological parameter which

were greater than the required confidence interval value 0.101 for significance.



**Fig. 2: Graphical Illustration of Pre Test, Post Test and Adjusted Post Test Mean of CG, Tabata and sports vision training on Neuropsychological Parameter**

## RESULT AND FINDINGS ON SKILL PERFORMANCE PARAMETER

**Table V. Computation of Analysis of Co-Variance on skill performance**

TEST	CG	Tabata	Sports vision training	SV	SS	Df	MS	F	p-value
Pre-Test Mean	5.15	7.57	8.24	Between	8.43	2	4.218	128.31	.000
				Within	19.74	59	3.368		
Post-Test Mean	6.10	17.71	16.90	Between	33.73	2	16.865	99.16	.000
				Within	9.70	59	16.910		
Adjusted Mean	6.10	17.71	16.90	Between	33.73	2	166.768	110.20	.000
				Within	9.70	59	16.910		

“Note: SV: Source of Variable, SS: Sum of Square, MS: Mean Square, df: degree of freedom, CG: Control Group, Tabata, and Sports Vision Training.

The Table V shows that the adjusted post-test means of CG, Tabata, and Sports Vision Training are 6.10, 17.71, and 16.90, respectively. The obtained ‘f’ ratio of 110.20 for the adjusted post-test means is more than the table value of 3.23 for df 2 and 59 required for significance at 0.05 level of confidence on Neuropsychological parameter. The result of the study indicated that there was a significant difference

between adjusted post-test means of CG, Tabata, and Sport Vision Training group on Skill Performance.

Since, three groups were compared, whenever the obtained ‘f’ ratio for adjusted post-test was found to be significant, the scheffe’s test to find out the paired mean difference and it was presented in table II.

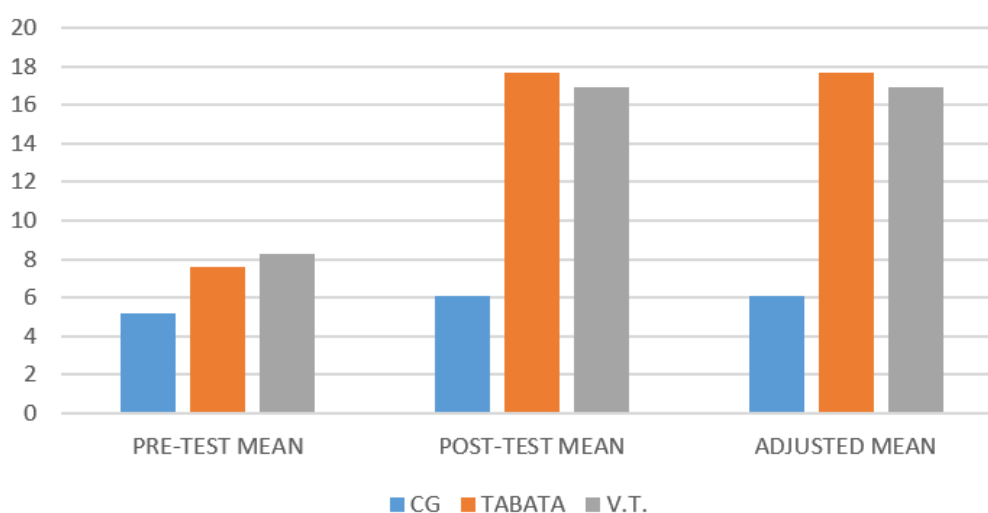
**Table VI Scheffe’s post hoc analysis for the differences between the adjusted post-test mean on Skill Performance**

Adjusted Post-Test Means			MD	CI
Tabata	Sports vision training	CG		
17.71	16.90		0.81	1.789
17.71		6.10	11.61	
	16.90	6.10	10.8	



Table VI shows that the mean difference values between CG and Tabata 11.61 and 10.8 respectively on

Skill Performance which were greater than the required confidence interval value 1.789 for significance.



**Fig. 3: Graphical Illustration of Pre Test, Post Test and Adjusted Post Test Mean of CG, Tabata and Sports vision training on Skill Performance**

## CONCLUSION

1. It was concluded that Tabata significantly altered on selected Biomotor Ability, Neuropsychological parameter, and Skill Performance Parameters among men football players compared to the CG.

2. There was a significant improvement on selected criterion variable due to Tabata training and Sports Vision Training. However, the improvement on Biomotor Ability was better in Tabata training group when compared to Sports Vision and control group.

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