

# SEGREGATED AND COLLABORATED EFFECT OF BALLISTIC TRAINING AND YOGIC PRACTICES ON PHYSIOLOGICAL PARAMETERS OF CRICKET PLAYERS

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## KEYWORDS

Ballistic Training,  
Yogic Practice,  
Vital Capacity and  
Breathe Holding  
Time.

## ABSTRACT

This study was designed to investigate the segregated and collaborated effect of ballistic training and yogic practices on physiological parameters of male cricket players. To achieve the purpose of the study (N=60) sixty cricket players who participated in the inter collegiate tournament for their respective colleges, affiliated to Vinayaka Mission's Research Foundation (Deemed to be University), Salem in the state of Tamil Nadu, India during the year 2023 – 2024 were selected as subjects. The age of the subjects ranged from 18 to 25 years. The selected players were randomly selected and assigned into four groups of fifteen subjects each (N = 15), group I underwent ballistic training (BTG), group II underwent yogic practice (YPG), group III underwent combined ballistic training and yogic practices (CBTYPG) and group IV acted as control group (CG), they were not assigned any specific training. The experimental group underwent their respective training programs for the duration of 12 weeks on alternative days, three days per week in addition to their regular programme in their curriculum design. The physiological variable such as vital capacity and breath holding time were selected as dependent variable and they were assessed by spiro meter in liters and digital stop watch in seconds. All the subjects were tested prior to and immediately after the training for the entire selected variable. The collected data were statistically analyzed using paired sample 't' test and ANCOVA. If the 'F' ratio has significant, the Scheffe's post hoc test was applied to know difference between the paired means. In all the cases 0.05 level of significance was fixed. It was concluded that 12 weeks combined ballistic training and yogic practice package has improve the vital capacity and breathe holding time of cricket players.

## 1. Introduction

Ballistic training employs the stretch-shorten cycle to increase power. Ballistic training, on the other hand, focuses on the intent, velocity, and continuous acceleration of exercises throughout the concentric phase, rather than the storage and use of elastic energy to improve players' athletic abilities. As a consequence, various loads may be used to increase power, rate of force generation, motor-unit recruitment, and intra- and inter-muscular coordination along the force-velocity curve. These qualities may enhance the dynamic correspondence of this training method. Landing and catching large objects is inherently risky, thus practitioners should carefully plan ballistic programs, moving from empty to loaded, and only begin after appropriate strength levels have been established (Pearson, 2014).

Yoga, a 3,000-year-old practice, is today acknowledged in the Western world as a holistic approach to health, and the National Institutes of Health classifies it as Complementary and Alternative Medicine (CAM) (Williams's et. al., 2003). Yoga induces a physiological condition that is opposite to the flight-or-fight stress reaction, and this stoppage in the stress response can lead to a sense of balance and oneness between the mind and body (Arora & Bhattacharjee, 2008). Yoga therapy include imparting yogic practices and teachings to prevent or cure structural, physiological, emotional, and spiritual pain, suffering, or limits. Yogic practices increase muscular strength and flexibility, promote and improve respiratory and cardiovascular function, aid in the recovery and treatment of addiction, reduce stress, anxiety, depression, and chronic pain, improve sleep patterns, and improve overall well-being and quality of life (Collins, 1998).

Cricket is a team sport in which players must do a variety of tasks such as throwing, bowling, and batting, as well as bowling, fielding, batting, and wicket-keeping all at once. Because of its intermittent character, this game puts a significant strain on the physiological and neuromuscular systems. Batsmen play an important part in all game types, with each having its own set of physiological needs. The physiological demands imposed during cricket batting have historically received little attention, with most study focused on bowling reactions and hitting technique. A better knowledge of the physiological demands of the batting role in cricket is needed to help strength and conditioning specialists and coaches construct training regimens, rehabilitation procedures, and player-management tactics (Scanlan et. al., 2016).

## 2. Objectives

The problem addressed in this study was to find out the segregated and collaborated effect of ballistic training and yogic practices on physiological parameters of male cricket players.

## 3. Methodology

To achieve the purpose of the study (N=60) sixty cricket players who participated in the inter collegiate tournament for their respective colleges, affiliated to Vinayaka Mission's Research Foundation (Deemed to be University), Salem in the state of Tamil Nadu, India during the year 2023-2024 were selected as subjects. The age of the subjects ranged from 18 to 25 years. The selected players were randomly selected and assigned into four groups of fifteen subjects each (N = 15), group I underwent ballistic training (BTG), group II underwent yogic practices (YPG), group III underwent combined ballistic training and yogic practice (CBTYPG) and group IV acted as control group (CG), they were not assigned any specific training. The experimental group underwent their respective training programs for the duration of 12 weeks on alternative days, three days per week in addition to their regular programme in their curriculum design. The physiological variable such as vital capacity and breath holding time were selected as dependent variable and they were assessed by spiro meter in liters and digital stop watch in seconds. All the subjects were tested prior to and immediately after the training for the entire selected variable. The collected data were statistically analyzed using paired sample 't' test and ANCOVA. If the f ratio has significant, the Scheffe's post hoc test was applied to know difference between the paired means. In all the cases 0.05 level of significance was fixed.

#### 4. Results

The results were presented in the following tables.

**Table – I: Significance of Mean Gains / Losses between Pre Post-Test and ‘T’ Ratio of BTG, YPG, CBTYPG and CG on Vital Capacity and Breath Holding Time of Male Cricket Players**

Variables	Pre Test Mean	(±SD)	Post-test Mean	(±SD)	MD	SE	‘t’ ratio
<b>Ballistic Training (BTG)</b>							
Vital Capacity	2.76	0.04	3.05	0.18	0.29	0.04	5.93*
Breath Holding Time	35.62	0.78	40.26	2.82	4.63	0.70	6.55*
<b>Yogic Practices (YPG)</b>							
Vital Capacity	2.78	0.06	3.07	0.20	0.28	0.05	5.35*
Breath Holding Time	35.49	0.93	40.07	2.65	4.58	0.70	6.52*
<b>Combined Ballistic Training and Yogic Practices (CBTYPG)</b>							
Vital Capacity	2.78	0.05	3.28	0.05	0.49	0.02	22.44*
Breath holding time	35.41	0.80	43.13	0.91	7.71	0.31	24.14*
<b>Control Group (CG)</b>							
Vital Capacity	2.80	0.05	2.88	0.18	0.08	0.04	1.85
Breath Holding Time	34.97	0.91	35.79	2.67	0.82	0.56	1.46

**Required T (.05), (df 14) =2.14 \* Significant at .05 level of confidence**

The table-I shows that that the obtained “t” values of the BTG on 5.93 and 6.55 for vital capacity and breath holding time respectively. The obtained “t” values of the YPG on variables are: 5.35 and 6.52 for vital capacity and breath holding time respectively. The obtained “t” values of the CBTYPG on variables are: 22.44 and 24.14 for vital capacity and breath holding time respectively. The obtained “t” values of the control group on variables are: 1.85 and 1.46 for vital capacity and breath holding time respectively. The obtained t- values are significant at .05 levels for the degree of freedom of 1 df 14, and the required critical value is 2.14 Hence the obtained t-values on the selected variables are higher than the required critical value. The control group values on the selected variables are lower than the required critical value. It was concluded that the BTG, YPG and CBTYPG has produced significant changes positively from its baseline to post-treatment on selected physiological variables among male cricket players.

**Table – II: Analysis of Covariance of Adjusted Post Tests Scores of Experimental and Control Groups on Vital Capacity and Breath Holding Time**

BTG	YPG	CBTYPG	CG	SOV	SS	df	MS	‘F’ Ratio
<b>Adjusted Post Test Mean</b>								
<b>Vital Capacity</b>								
3.06	3.07	3.28	2.87	<b>B.S.</b>	1.211	3	.404	14.28*
				<b>W.S.</b>	1.555	55	.028	
<b>Breath Holding Time</b>								
40.06	39.98	43.10	36.12	<b>B.S.</b>	353.489	3	117.830	21.97*
				<b>W.S.</b>	294.892	55	5.362	

**Required F(.05 (df 3,55) =2.77 \* Significant at 0.05 level of confidence**

Ballistic Training (BTG), Yogic Practices (YPG), Combined Ballistic Training and Yogic Practice (CBTYPG)

Table-II shows that the adjusted post test mean value of vital capacity and breath holding time for BTG, YPG, CBTYPG and CG are 3.06, 3.07, 3.28 and 2.87; 40.06, 39.98, 43.10 and 36.12 respectively. The obtained 'F' ratio of 14.28 and 21.97 for adjusted post-test means was greater than the table value of 2.77 for df 3 and 55 required for significance at .05 level of confidence on vital capacity and breath holding time. The results of the study indicated that there was a significant difference the adjusted post-test means of BTG, YPG, CBTYPG and CG on vital capacity and breathe holding time.

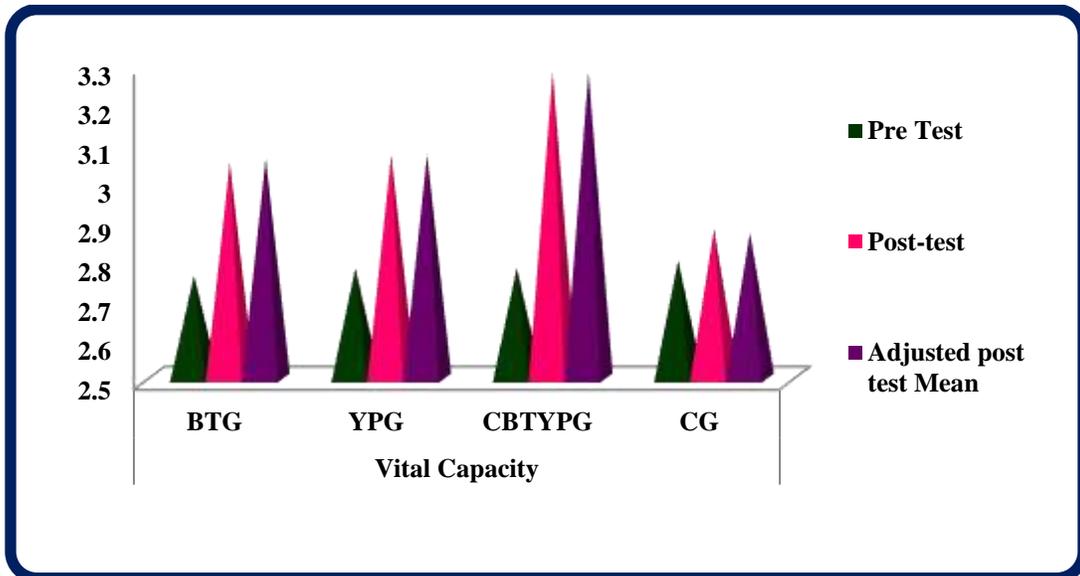


Figure I: Pre, Post and Adjusted Post-Test Means Values of Experimental and Control Groups on Vital Capacity and Breath Holding Time of Male Cricket Players

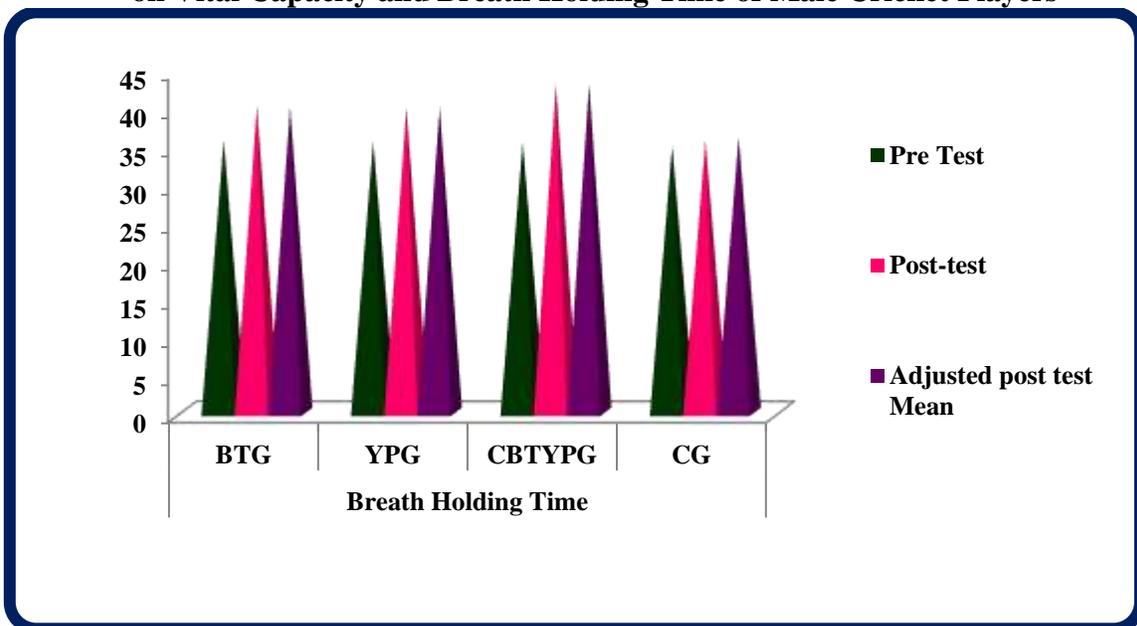


Figure II: Pre, Post and Adjusted Post-Test Means Values of Experimental and Control Groups on Vital Capacity and Breath Holding Time of Male Cricket Players

## 5. Discussion on Findings

The study's findings demonstrate that BTG, YPG and CBTYPG, significantly improved vital capacity and breath holding time as compared to the control group. As a result, twelve weeks of BTG, YPG, and CBTYPG significantly improved the vital capacity and breath holding time of male cricket players. The results of the study are in conformity with the findings of **Sathuluri et. al., (2023), Varalakshmy et. al., (2020) Sankar & Mahaboobjan, (2023) and Zahoor Khan & Jain, (2020).**

## 6. Conclusions and Future Scope

The study found that ballistic training, yogic practices, and combined ballistic training and yogic practice programs had a substantial influence on changes in vital capacity and breath holding time in male cricket players. When compared to ballistic training and yogic practices separately, combined ballistic training and yogic practices demonstrated greater improvement on selected physiological variables. In the light of the study, similar research can be conducted by the state, central universities and autonomous institutions on different training methods and coaching methodologies to refine players performance in sports.

## References

1. Arora, S., & Bhattacharjee, J. (2008). Modulation of Immune Responses in Stress by Yoga. *International journal of yoga*, 1(2), pp.45–55.
2. Collins C. (1998). Yoga: Intuition, Preventive Medicine, and Treatment. *Journal of Obstetric, Gynecologic, and Neonatal Nursing: Jognn*, 27(5), pp.563–568.
3. Deepak Kumar Dogra (2015). Effect of Combined Core and Plyometric Training Programme on Power and Muscular Strength of Tripura Cricketers, *International Journal of Advanced Research in Engineering and Technology* Volume 6, Issue 1, pp. 51-55.
4. Kaukab Azeem, Mohammed Hamdan Hashem Mohammed (2019). The Effect of Resistance Training on the Selected Physical and Physiological Variables of the Male Students *International Journal of Pharmaceutical Research & Allied Sciences*, 8(2), pp.198-205.
5. Mukesh Kumar Mishra, Ajay Kumar Pandey, Shivendra Dubey (2015). Effect of Eight Weeks Yogic Training on Selected Physiological Variables, *International Journal of Physical Education, Sports and Health*, 1(3), pp.50-52.
6. Nandi S, Adhikari H, Bera TK. (2004). Effects of Aerobic Exercise, Yogic Practice and the Combination of Both on Cardio Respiratory Endurance, *Yoga Mimamsa*, 35(3-4), pp.152-159.
7. Pearson S., (2024). Ballistic Training, *Science for Sport*, <https://www.scienceforsport.com/ballistic-training>.
8. Prem MA, Rajan KM. (2017). Effect Yogic Practices on Selected Physical and Physiological Variables among College Men Hockey Players. *Asian J Appl Res*, 7:3(8), pp.8-10.
9. Rejinadevi K, Ramesh K. (2017). Effect of Yogic Practices on Selected Physiological Variables among Basketball Players, *International Journal of Computational Research and Development*, 2(2), pp.107-110.
10. Samsudeen S, Kalidasan R. (2007). Influences of Game Specific Field Training and Yogic Practices on Physical, Physiological, Psychological and Performance Variables among College Level Cricketers, Paper Presented at the International Conference on “Metabolic Syndrome in Yoga and Naturopathy,” Alagappa University, Karaikudi, 2007.
11. Sankar M., and Mahaboobjan A (2023). Impact of Yogic Practices on Selected Physiological Variables among Inter Collegiate Male Cricket Players. *International Journal of Yoga, Physiotherapy and Physical Education*, 8 (4), pp.33-36.

12. Siva Kumar, NS. (2019). Effect of Yogic Practices and Physical Exercise on Flexibility and Resting Heart Rate among Male Cricket Players, *International Journal of Physiology, Nutrition and Physical Education*, 4(1), pp.1094-1096.
13. Subramanian, A. (2014). Investigation of Core Strength Training Induced Adaptations on Selected Physical and Physiological Parameters of Cricket Players, *International Journal of Physical Education, Fitness and Sports*, Vol.3. No.1., pp.65-70.
14. Suresh Kumar M. (2019). Effect of Yogic Practices on Selected Lung Volumes among Asthmatic Men, *The International Journal of Analytical and Experimental Modal Analysis*, 11(7), pp.1286-1290.
15. Tanner, R, and Gore, C (Eds.), *Physiological Tests for Elite Athletes* (2nd ed.) Champaign,IL: Human Kinetics; 289, 2012.
16. Varalakshmy, S., ArunPrasanna, T., .Mano Ranjith, R., .Sundar, M., Senthil kumaran, R., & Pounraj, C. (2020). Collision of Ballistic and Plyometric Training on Selected Explosive Power and Vital Capacity of College Men Volleyball Players. *High Technology Letters*, 26 (6), pp.593-601.
17. Williams, K., Steinberg, L., Petronis, J. (2003). Therapeutic Application of Iyengar Yoga for Healing Chronic Low Back Pain. *Int J Yoga Ther*, 13, pp.55–67.
18. Zahoor Khan, K., and Jain, R. (2020). Isolated and Combined Effect of Yogic and Physical Exercises on Selected Physical, Physiological and Anthropometric Variables among College Men Football Players in Vellore district of Tamil Nadu, *International Journal of Physical Education, Sports and Health*, 7(6), pp.94-98.