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EFFECT OF SPECIFIC TRAINING PROGRAMME ON SELECTED PHYSICAL AND PHYSIOLOGICAL PARAMETERS OF ADOLESCENT BOYS' CYCLISTS

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ABSTRACT

Cycle specific training is a scientifically structured method that categorizes exercise intensity based on physical fitness and physiological indicators such as heart rate. It plays a vital role in improving physical fitness and physiological efficiency in endurance athletes. The purpose of this study was to examine the effect of specific training programme on selected physical and physiological parameters of adolescent boys cyclists.

Thirty (N=30) adolescent boys cyclists aged between 13 -17 years were selected and randomly divided into two equal groups: experimental group (n=15) and control group (n=15). The experimental group underwent a structured cycle zone training programme for 12 weeks, with sessions conducted three days per week, while the control group continued their routine activities without specialized training.

The selected physical physiological parameters included leg strength, muscular strength endurance and physiological variables included cardiovascular endurance and breath holding time. A pre-test and post-test randomized group design was adopted. The collected data were analyzed using the paired t-test with a level of significance set at 0.05.

The results indicated significant improvements in the experimental group compared to the control group. It was concluded that cycle zone training significantly enhances physical and physiological parameters of adolescent boys cyclists.

KEYWORDS: *Specific Training, Leg Strength, Muscular Strength Endurance, Cardiovascular Endurance And Breath Holding Time.*

INTRODUCTION

Cycling is a widely practiced endurance sport that demands a high level of physical fitness and physiological efficiency. Performance in cycling is primarily influenced by physical fitness components such as **leg strength** and **muscular strength Endurance**, along with physiological capacities including **cardiovascular endurance** and **breath-holding time**, which reflect cardiovascular and respiratory efficiency.

One of the most effective training approaches in cycling is **zone-based training**, which categorizes exercise intensity into distinct zones based on heart rate responses. These zones range from low-intensity recovery efforts to high-intensity anaerobic workloads, with each zone eliciting specific adaptations in the body. For instance, lower zones enhance aerobic endurance, while higher zones improve anaerobic power and tolerance.

For adolescent cyclists, adopting a structured training methodology is crucial to ensure progressive development and to minimize the risk of overtraining or injury. Zone training facilitates systematic intensity distribution, thereby improving both aerobic and anaerobic capacities in a safe and controlled manner.

Despite its widespread application among elite athletes, there is limited research focusing on the effectiveness of cycle zone training in adolescent populations. Therefore, the present study aims to examine the impact of zone-based cycling training on selected physical fitness variables such as **leg strength** and **muscular strength endurane**, and physiological variables including **cardiovascular endurance** and **breath-holding time**.

The benefits of cycle zone training include improved cardiovascular endurance, enhanced muscular strength and stamina, increased oxygen uptake (VO_2 max), reduced resting heart rate, and overall improvement in cycling performance.

METHODOLOGY

Selection of Subjects

Thirty (30) adolescent boys cyclists were selected as subjects.

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Group Division

- Experimental Group (n=15)
- Control Group (n=15)

Training Programme

- Duration: 12 weeks
- Frequency: 3 days per week
- Session Duration: 60 minutes

Training Structure

- Warm-up: 10 minutes
- Zone Training (Main Workout): 30 minutes
- Cool-down: 10 minutes

Variables Selected

Physical Variables

- Leg Strength
- Muscular Strength Endurance

Physiological Variables

- Cardiovascular endurance
- Breath-holding time

Testing Procedure

- Leg strength : Wall Half Squat (Wall Sit) Test
- Muscular Strength Endurance : Sit-ups test
- Cardiovascular Endurance: Assessed through *Pulse Rate (Beats Per Minute - BPM)*
- Breath holding time; Measured using *Stopwatch* (in seconds)

Statistical Analysis;

lected data were analyzed using the paired t-test. The level of significance was fixed at 0.05.

Table 1

Computation of the 't' ratio on the experimental group and the control group selected physical and physiological parameters on adolescent boys cyclist.

Group	Variables		Test	Mean	Standard Deviation	Standard Error Mean	't' Ratios
Experimental Group	Physical Variables	Muscular strength Endurance	Pre Test	23.80	3.05	0.79	5.32*
			Post Test	32.40	3.30	0.85	
		Leg Strength	Pre Test	33.90	4.00	1.03	4.48*
			Post Test	42.60	3.60	0.93	
	Physiological variables	Cardio vascular Endurance	Pre Test	79.20	4.20	1.08	4.25*
			Post Test	72.10	3.75	0.97	
		Breath Hold	Pre Test	34.10	2.80	0.72	3.96*
			Post Test	40.30	3.00	0.77	
Control Group	Physical Variables	Muscular strength Endurance	Pre Test	23.50	3.00	0.77	0.91
			Post Test	24.60	3.20	0.83	
		Leg Strength	Pre Test	34.00	3.95	1.02	0.83
			Post Test	34.80	3.90	1.01	
	Physiological variables	Cardio vascular Endurance	Pre Test	78.80	4.10	1.06	0.74
			Post Test	78.00	4.05	1.04	
		Breath Hold	Pre Test	34.20	2.75	0.71	0.66
			Post Test	34.90	2.85	0.73	

* Significant at 0.05 level (Table value = 2.14)

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RESULTS

- The experimental group showed significant improvement in all selected variables
- The control group showed no significant improvement
- The calculated t-values were greater than the table value

DISCUSSION

The improvement in cardiovascular endurance and Breath hold indicates enhanced aerobic capacity and oxygen utilization. The increase in muscular strength Endurance may be due to repeated cycling efforts and resistance during training.

The decrease in resting heart rate reflects improved cardiac efficiency and adaptation to training. These findings are supported by studies such as Lucia et al., which highlight the effectiveness of structured intensity training in cyclists.

CONCLUSION

- Cycle zone training significantly improves cardiovascular endurance
- It enhances muscular strength Endurance and leg strength
- It improves Cardiovascular endurance and reduces resting heart rate
- It is an effective training method for adolescent cyclists

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