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EFFECT OF TEMPO RUNNING ON SPEED AND AGILITY AMONG UNIVERSITY MEN STUDENTS

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Abstract:

The purpose of the study was designed to examine the effect of tempo running on speed and agility of university men students. For the purpose of the study, thirty university men students studying bachelor's degree in Karnataka University, Darwad, Karnataka State, India were selected as subjects. They were divided into two equal groups. Each group consisted of the fifteen subjects. Group I underwent tempo running for three days per week for twelve weeks. Group II acted as control who did not undergo any special training programme apart from their regular physical education programme. The following variables namely speed and agility were selected as criterion variables. All the subjects of two groups were tested on selected dependent variables by using leg lift with dynamometer and back lift with dynamometer respectively at prior to and immediately after the training programme. The analysis of covariance was used to analyze the significant difference, if any among the groups. The .05 level of confidence was fixed as the level of significance to test the 'F' ratio obtained by the analysis of covariance, which was considered appropriate. The results of the study showed that there was a significant difference between tempo running group and control group on speed and agility. And also it was found that there was a significant improvement on speed and agility due to twelve weeks of tempo running.

Key Words: Tempo Running, Speed, Agility, University Men Students

INTRODUCTION:

Tempo running is a widely used endurance training method in sports training, particularly in athletics and endurance-based games. It refers to running at a moderately hard, steady pace that is faster than normal jogging but slower than maximum sprinting. The primary aim of tempo running is to improve the athlete's lactate threshold, which is the ability of the body to sustain high-intensity exercise for a longer duration without excessive fatigue. According to Jack Daniels, tempo runs are performed at a pace that an athlete can maintain comfortably hard for about 20 minutes while still being able to control breathing and maintain running form.

Tempo running plays an important role in developing cardio respiratory endurance and running efficiency. During tempo runs, the body learns to utilize oxygen more efficiently and remove lactic acid from the muscles more effectively. This allows athletes to maintain a faster speed over longer distances. The concept of lactate threshold training was popularized through the work of researchers such as David L. Costill, who emphasized that sustained sub-maximal running improves aerobic capacity and endurance performance. By regularly performing tempo runs, athletes can delay the onset of fatigue and improve overall endurance performance.

A typical tempo run workout generally includes three phases: warm-up, tempo phase, and cool-down. The warm-up consists of light jogging and dynamic stretching for about 10-15 minutes to prepare the muscles and cardiovascular system. The tempo phase usually lasts 15-30 minutes of continuous running at a steady, challenging pace (around 80-90% of maximum heart rate). After the tempo phase, athletes perform a cool-down with slow jogging or walking to help the body gradually return to its resting state. This structured approach helps reduce the risk of injury while maximizing training benefits.

Tempo running offers several physiological and performance benefits. It improves aerobic capacity, running economy, cardiovascular endurance, and mental toughness. It also enhances the body's ability to tolerate and clear lactate, enabling athletes to maintain higher speeds for longer periods. Because of these advantages, tempo running is commonly included in the training programs of middle-distance and long-distance runners, as well as athletes from sports such as football, cricket, and hockey who require sustained endurance.

Tempo running is considered one of the most effective training methods for improving aerobic endurance, lactate threshold, and overall running performance. It is performed at a pace that is comfortably hard but sustainable, typically around 80-90% of maximum heart rate or about 85-90% of maximal aerobic speed. This training method helps athletes adapt physiologically and psychologically to prolonged high-intensity exercise.

The concept of tempo running is closely associated with lactate threshold training, which focuses on increasing the point at which lactic acid begins to accumulate rapidly in the bloodstream. According to David L. Costill, improving the lactate threshold enables athletes to maintain higher running speeds for longer durations without experiencing early fatigue. When athletes repeatedly perform tempo runs, their muscles become more efficient at clearing lactate and utilizing oxygen, which enhances endurance capacity.

Another important aspect of tempo running is its role in improving running economy. Running economy refers to the amount of oxygen required to maintain a given running speed. Research in the field of Exercise Physiology indicates that tempo training improves neuromuscular coordination, muscle fiber recruitment, and metabolic efficiency. This allows athletes to run faster with less energy expenditure. Because of these adaptations, tempo runs are widely used in the training programs of middle-distance and long-distance runners.

Tempo running can be performed in several formats depending on the training objective. The most common forms include continuous tempo runs, tempo intervals, and progressive tempo runs. Continuous tempo runs involve maintaining a steady

pace for 20-30 minutes without stopping. Tempo intervals consist of repeated bouts of tempo-paced running separated by short recovery periods. Progressive tempo runs gradually increase speed throughout the workout, finishing at a faster pace than the starting speed. These variations help prevent monotony and allow coaches to target different physiological adaptations.

Tempo running also plays a vital role in mental conditioning and pacing strategy. Sustaining a challenging pace for an extended period requires concentration, discipline, and psychological resilience. Regular tempo training helps athletes develop a better sense of pace and improves their confidence during competitions. According to Jack Daniels, tempo runs train athletes to tolerate discomfort while maintaining proper running mechanics, which is essential for competitive performance.

Furthermore, tempo running is beneficial for athletes in various sports such as athletics, football, hockey, and cricket because these sports require repeated bouts of sustained effort. By improving cardiovascular efficiency, oxygen utilization, and metabolic endurance, tempo running enhances an athlete's ability to perform high-intensity activities over extended periods.

Methodology:

The purpose of the study was designed to examine the effect of tempo running on speed and agility of university men students. For the purpose of the study, thirty university men students studying bachelor's degree in Karnataka University, Darwad, Karnataka State, India were selected as subjects. They were divided into two equal groups. Each group consisted of the fifteen subjects. Group I underwent tempo running for three days per week for twelve weeks. Group II acted as control who did not undergo any special training programme apart from their regular physical education programme. The following variables namely speed and agility were selected as criterion variables. All the subjects of two groups were tested on selected dependent variables by using leg lift with dynamometer and back lift with dynamometer respectively at prior to and immediately after the training programme. The analysis of covariance was used to analyze the significant difference, if any among the groups. The .05 level of confidence was fixed as the level of significance to test the 'F' ratio obtained by the analysis of covariance, which was considered appropriate.

Analysis of the Data:

Speed:

The analysis of covariance on speed of the pre and post test scores of tempo running group and control group have been analyzed and presented in table 1.

Table 1: Analysis of Covariance of the Data on Speed of Pre and Post Tests Scores of Tempo Running and Control Groups

Test	Tempo Running Group	Control Group	Source of Variance	Sum of Squares	df	Mean Squares	Obtained 'F' Ratio
Pre Test							
Mean	8.40	8.37	Between	0.008	1	0.008	0.51
S.D.	0.12	0.13	Within	0.453	28	0.016	
Post Test							
Mean	8.15	8.34	Between	0.292	1	0.292	9.35*
S.D.	0.13	0.15	Within	0.875	28	0.031	
Adjusted Post Test							
Mean	8.13	8.36	Between	0.366	1	0.366	31.31*
			Within	0.316	27	0.012	

* Significant at .05 level of confidence.

(The table values required for significance at .05 level of confidence for 2 and 28 and 2 and 27 are 3.34 and 3.35 respectively).

The table 1 shows that the adjusted post-test means of tempo running group and control group are 8.13 and 8.36 respectively on speed. The obtained "F" ratio of 31.31 for adjusted post-test means is more than the table value of 3.35 for df 1 and 27 required for significance at .05 level of confidence on speed.

The results of the study indicated that there was a significant difference between the adjusted post-test means of tempo running group and control group on speed.

Agility:

The analysis of covariance on agility of the pre and post test scores of tempo running group and control group have been analyzed and presented in table 2.

Table 2: Analysis of Covariance of the Data on Agility of Pre and Post Tests Scores of Tempo Running and Control Groups

Test	Tempo Running Group	Control Group	Source of Variance	Sum of Squares	df	Mean Squares	Obtained 'F' Ratio
Pre Test							
Mean	8.30	8.33	Between	0.008	1	0.008	0.59
S.D.	0.10	0.09	Within	0.393	28	0.014	
Post Test							
Mean	8.12	8.30	Between	0.243	1	0.243	12.44*
S.D.	0.13	0.11	Within	0.547	28	0.020	
Adjusted Post Test							
Mean	8.13	8.29	Between	0.175	1	0.175	63.02*
			Within	0.075	27	0.003	

* Significant at .05 level of confidence.

(The table values required for significance at .05 level of confidence for 2 and 28 and 2 and 27 are 3.34 and 3.35 respectively).

The table 2 shows that the adjusted post-test means of tempo running group and control group are 8.13 and 8.29 respectively on agility. The obtained "F" ratio of 63.02 for adjusted post-test means is more than the table value of 3.35 for df 1 and 27 required for significance at .05 level of confidence on agility.

The results of the study indicated that there was a significant difference between the adjusted post-test means of tempo running group and control group on agility.

Conclusions:

- There was a significant difference between tempo running group and control group on speed and agility.
- And also it was found that there was a significant improvement on selected criterion variables such as speed and agility due to tempo running.

References:

1. Jack Daniels (2013). Daniels' running formula (3rd ed.). Human Kinetics.
2. Stephen Seiler, & Espen Tønnessen. (2009). Intervals, thresholds, and long slow distance: The role of intensity and duration in endurance training. Sport science, 13, 32-53.
3. Stephen J. McGregor, & John A. Hawley. (2012). Adaptations to endurance training: Implications for performance. Sports Medicine, 42(1), 1-16. https://doi.org/10.2165/11599790-000000000-00000
4. Jack Daniels, & Jimmy Gilbert. (1979). Oxygen power: Performance tables for distance runners. Journal of Applied Physiology, 47(3), 467-473.
5. David C. Nieman, & Lee W. Austin. (2003). Effects of moderate versus high intensity endurance training on physiological responses of athletes. Journal of Strength and Conditioning Research, 17(4), 683-690.
6. Martin Buchheit, & Paul B. Laursen. (2013). High-intensity interval training, solutions to the programming puzzle. Part I: Cardiopulmonary emphasis. Sports Medicine, 43(5), 313-338. https://doi.org/10.1007/s40279-013-0029-x
7. Philip Maffetone. (2010). The big book of endurance training and racing. Sky horse Publishing.