

## PSYCHOLOGICAL DETERMINANTS AND THEIR ASSOCIATION WITH CYCLING PERFORMANCE OF INDIAN ELITE ROAD CYCLISTS

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### Abstract:

The purpose of the present study was to determine some psychological variables associated with cycling performance of Indian elite road cyclists. Twenty-one male road cyclists of age ( $24.49 \pm 2.36$ ) years were selected for this study. Some selected psychological parameters like Intelligence Quotient (IQ) test examines intelligence, perfection, understanding measured by Raven's Standard Progressive Matrices, Emotional Intelligence (EQ) and Emotional stability was measured by Emotional Intelligence Scale by Hyde and Pethe, Focus, speed judgment, reaction time was measured by Vienna Test System (VTS), Schuhfried company and Motivation was measured by test for Motivational (Modified) ASI, Pune. Descriptive and inferential statistical tools were used for data analysis. Pearson's product moment correlation was used to find out correlation between psychological variables and Individual Time trial (ITT) cycling performance. Some selected anthropometric and body composition parameters were assessed and results as follows; age ( $24.49 \pm 2.36$  years), body height ( $1.74 \pm 0.04$  cm), body weight ( $68.05 \pm 4.61$  kg), BMI ( $22.49 \pm 0.97$ ), body fat % ( $12.62 \pm 1.66$ ) and water % ( $54.33 \pm 1.79$ ). The analysis result revealed that Focus ( $r = -0.92$ ), EQ ( $r = -0.81$ ), Motivation ( $r = -0.78$ ) and Emotional Stability ( $r = -0.65$ ) were all strongly and negatively correlated with ITT cycling performance, indicating that higher levels of these psychological variables were associated with faster performance times of elite road cyclists at 0.05 significance level of confidence. Intelligence Quotient (IQ) ( $r = -0.21$ ) showed a weak negative relationship with ITT cycling performance at 0.05 significance level of confidence. Therefore, the results of this study conclude that psychological variables are highly correlated with cycling performance. These results provide specific psychological status of Indian elite road cyclists, which are important for sports psychologists, sports scientists, coaches and cyclists as baseline data to identify talented athletes and prescribe mental skills training for elite cyclists. Further, it is recommended that study could be conducted on large population may contribute some new findings and on different sports events, gender and age groups.

**Keywords:** Emotional Intelligence, Motivation, Emotional Stability, Focus, Intelligence Quotient, Performance, Elite Cyclists, Sports Psychology

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### Introduction:

Cycling was used as a competitive sport, recreation and transportation. Competitive cycling has progressed from a recreational leisure into one of the most physically and psychologically demanding endurance sports in the world. Cycling is a sport organized for amateur and professional races, which are held mostly all around the world. In modern times, recreational cycling has opted for a fitness drive. The first official bicycle race was held on 31 May 1868, in the park of Saint-Cloud, Paris, over 1200 meters distance (Herlihy, 2004). The Union Cyclist International (UCI) is an independent international federation of cycling which was recognized by the International Olympic Committee (IOC). It was established in Paris in 1900, the UCI headquarter is situated at World Cycling Centre (WCC) in Aigle,

Switzerland. *The cycling events are organized at the national level by individual national cycling federations. The cycling competition is categorized as road, track, MTB, cyclo-cross and BMX races.*

### **Indian Scenario in Cycling:**

Cycling as a sport was introduced in India with the efforts of Shri Janki Das in mid-thirties and first time participated in the British Empire Games at Sydney (Australia) in 1938 with Swami Jagan Nath who accompanied as Manager. The 1<sup>st</sup> Asian Games were held at National Stadium, New Delhi in 1951, the Indian cycling team won Silver Medal in Team Pursuit, Bronze Medal in 1000 m Time Trial and secured 4<sup>th</sup> position in 120 miles road race. Presently, the Cycling Federation of India manages cycling training and development program at various State units and NCOE SAI Centres. In 2015, the Union Cycliste Internationale (UCI) declared to open a satellite center in New Delhi velodrome which is a legacy of the 2010 Commonwealth Games and host of the 2015 Asia Track Cup. It was a collaboration between the UCI World Cycling Centre (WCC), Sports Authority of India (SAI) and Cycling Federation of India (CFI). As a result, Indian Track men's team cyclists created a history in the Team Sprint event after winning a gold medal at the World Junior Track Cycling Championships in Frankfurt, Germany. Indian junior cyclists clinched four gold medals in Track Asia Cup in 2019. And held the world number 1 rank in Men's Junior Individual sprint, kilometer Time Trial and Keirin at the same time during 2020. The Indians Road riders participated in UCI Road World Championships in the time trial event in 2016 and finished 55<sup>th</sup>. The junior men's team won a silver medal in the team sprint event at the 2024 Asian Track Cycling Championships, a historic gold medal was won by the men's team of Esow Alben, Ronaldo Singh, and Rojit Singh in the team sprint event. It was India's first gold medal in a global cycling competition at World Junior Championships 2019. Esow Alben secured two individual medals at the event at World Junior Championships 2019. L. Ronaldo Singh became the World No. 1 in all four junior sprint categories in 2020 UCI World Rankings. Harshita Jakhar won Silver in the Individual Pursuit (junior category), Bronze in the Team Pursuit, Bronze in the Madison event (women's junior category) at the Asian Track Cycling Championships 2024, New Delhi. Latest UCI Road World Championships 2025 (Women's Junior Time Trial, Kigali), she represented India and finished 39<sup>th</sup> position.

### **Demands of the Sport:**

Road cycling is an extreme endurance sport that places high demands on the physical and physiological, biomechanical, psychological and tactical abilities. Elite cyclists establish exceptional aerobic capacity ( $VO_2$  max), efficient lactate threshold management, and superior muscle endurance (Jeukendrup et al., 2000). The success in competitive cycling depends on an athlete's ability to sustain high-intensity effort for extended periods of time while instantaneously maintaining concentration, motivation, emotional stability and decision-making under to achieve optimal cycling performance. Cyclist frequently faces unpredictable conditions such as weather changes, crashes, mechanical breakdown and strategic pressure from opponent's competitor. Maintaining composure and focus in these situations distinguishes elite cyclists from normal cyclist (Weinberg & Gould, 2019). Team events need coordination, communication and understanding of tactics such as drafting, pacing, breakaways and positioning (Passfield & Doust, 2000).

### **Objectives of the Study:**

The purpose of the present study was designed to investigate the relationship between the psychological variables and cycling performance among Indian elite road cyclists. The psychological profile status of elite road cyclists to provide

baseline data for coaches, sports psychologists and performance analysts in designing athlete-specific psychological training interventions and to compare with their performance.

### Methodology:

A correlational and mixed-method of research was used in this study. Twenty-one male elite road cyclists aged 22 to 28 years were selected using purposive sampling technique. The sample had experience of 3-4 years of cycling at elite level. The data was collected by selected psychological tests to measure the psychological variables and ITT cycling performance of elite road cyclists.

### Collection of Data:

The data was collected by selected psychological tests to measure the psychological variables of elite road cyclists. These selected psychological parameters like Intelligence Quotient (IQ) test examines intelligence, perfection, understanding measured by Raven's Standard Progressive Matrices, Emotional Intelligence (EQ) and Emotional stability was measured by Emotional Intelligence Scale by Hyde and Pethe, Focus, speed judgment, reaction time was measured by Vienna Test System (VTS), Schuhfried company and Motivation was measured by test for Motivational (Modified) ASI, Pune.

### Statistical tools:

Descriptive and inferential statistical tools were used for data analysis. Pearson's product moment correlation was used to find out association between variables.

### Result and Interpretation:

Table 1							
Descriptive Statistics for Anthropometric and Body Composition for Elite Road Cyclists (N=21)							
Factors	Age (year)	Hight (mtr)	Body mass (kg)	BMI	Body fat %	Water %	Muscle mass (kg)
Mean	24.49	1.74	68.05	22.49	12.62	54.33	57.11
SEM	0.51	0.01	1.01	0.21	0.36	0.39	0.69
Std Dev	2.36	0.04	4.61	0.97	1.66	1.79	3.46
Kurtosis	0.12	0.02	0.10	-0.12	-0.19	-0.96	0.5
Skewness	-0.01	0.04	-0.10	-0.58	0.64	-0.31	-0.2
Min	19.50	1.65	59.20	20.25	10.40	51.00	49.8
Max	29.10	1.83	78.20	23.94	16.60	57.00	65.3

Table 1 shows the descriptive statistics for anthropometric and body composition for elite road cyclists as age (24.49±2.36 years), body height (1.74±0.04 cm), body weight (68.05±4.61 kg), BMI (22.49±0.97), body fat % (12.62±1.66) and water % (54.33±1.79), Muscle mass (57.11±3.46 kg).

Table 2	
Correlation of Psychological variable and Cycling Performance 42 km ITT for Elite Road Cyclists (N=21)	
Factors	Performance (sec)
Focus	-0.921
Emotional Intelligence	-0.813
Motivation	-0.780
Emotional Stability	-0.648
Intelligence Quotient	-0.207

Table 2 reveals significant relationship of Focus ( $r = -0.921$ ), EQ ( $r = -0.813$ ), Motivation ( $r = -0.780$ ) and Emotional Stability ( $r = -0.648$ ) were all strongly and negatively correlated with ITT cycling performance, indicating that higher levels of these psychological variables were associated with faster performance times of elite road cyclists at 0.05 significance level of confidence. Intelligence Quotient (IQ) ( $r = -0.207$ ) showed a weak negative relationship with ITT cycling performance at 0.05 significance level of confidence.

### Conclusion:

The results of this study conclude that psychological variables are highly correlated with cycling performance. These results provide specific psychological status of Indian elite road cyclists, which are important for sports psychologists, sports scientists, coaches and cyclists as baseline data to identify talented athletes and prescribe mental skills training for elite cyclists. Further, it is recommended that study could be conducted on large population may contribute some new findings and on different sports events, gender and age groups.

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