# TRENDS IN INDIAN AND RUSSIAN WRESTLING: A COMPARATIVE STUDY

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**ABSTRACT**
This study aimed to have a comparative study of Indian and Russian wrestlers with respect to certain pre-identified parameters so as to gain an insight in the analysis of physical, psychological and physiological traits of both set of wrestlers and to identify key features that could be learned by both Russian and Indian wrestlers from each other. All the parameters, which were researched, were divided into three broad categories namely Physical variables, Psychological variables and Physiological variables. The study was undertaken on Men's Freestyle wrestlers by taking two top level wrestlers with credible past performance and top form from each national team in the six Olympic Wrestling weight divisions of 57kg, 65kg, 74kg, 86kg, 97kg and 125kg. After the collection of values for the purpose of the analyses, the various statistical procedures were employed. The required statistical calculations were computed with the help of SPSS software. The descriptive calculation and "t" test were computed. Among the physical variables that were found significant at 0.05 level of confidence includes – speed, agility, explosive strength, endurance and flexibility. However, in Abdominal Strength no significant difference was seen. Among the psychological parameters, two variables were found significant at difference was noticed in the Concentration ability. In the physiological parameters, the aforementioned five main variables were mapped but there was no significant difference.
*Keywords:* Wrestlers, Indian, Russian, physical, psychological, physiological parameters

## INTRODUCTION

Wrestling has a unique position among Olympic disciplines in both India and Russia; as for India it is this sport that provided first individual medal to newly independent nation to lately becoming most significant contributor in the medal tally, whereas for Russia, which is a wrestling super power, with such a large medal haul that erstwhile USSR still is the highest Olympic medal winner nation even though it last appeared in 1988 Olympics. Thus, wrestling having deep roots in both Indian and Russian culture has been one of an interesting and promising area of research.

### Significance of the Study

The study aims to bring out the significance through these factors between the wrestling players of India and Russia. The comparative study between a world leading nation in Russia and India will highlight the importance of overall training needs of wrestlers in India above and beyond the traditional component of physical strength alone, and will give a chance to undertake holistic training programs including psychological training.

The data to be collected and analyzed in the comparison of top wrestlers of both countries in most essential parameters required in wrestling match will be of immense help in analyzing the coaching system of India. Additionally, this research will certainly highlight the needs regarding some basic facilities, if any, into sports infrastructure to address any deficiencies that are identified. The present study has also the significance of proposing guidelines and indices for future researchers in the field of wrestling.

### Sample Design

Non-probability sampling techniques were used to determine the samples for the study. Samples to compare and study from were taken from 12 wrestlers, from each country, two wrestlers from each of the 6 Olympic weight categories, i.e. 57kg, 65kg, 74kg, 86kg, 97kg and 125kg who were in national camps and in top performance form and working closely with individual wrestling experts in national teams.

### Methodology of the Study

After a review of relevant literature, and keeping in view the requirements of modern wrestling discipline, all the parameters, which were studied, were divided into three broad categories, namely Physical, Psychological and Physiological variables.

Physical variables, respective test, and units

| | | | |
|---|---|---|---|
| 1. | Speed | 50 Meter Sprint | seconds |
| 2. | Agility | SEMO Agility Test (Kirby, 1971) | seconds |
| 3. | Abdominal Strength | 1-Minute sit-up Test | Total no. of sit-ups in 1 min. |
| 4. | Explosive Strength | Standing Broad Jump | centimeters |
| 5. | Endurance | Cooper Test | meters |
| 6. | Flexibility | Sit and Reach Test | centimeters |

Psychological variables and respective tests:

| | | |
|---|---|---|
| 1. | Competition Anxiety | the Sports Competition Anxiety Test (SCAT) (Martens, Vealey, & Burton,1990) |
| 2. | Concentration | Grid Concentration Test (Harris & Harris, 1984) |
| 3. | Sport Self Confidence | Sports Self Confidence Inventory (Vealy,1986) |

Physiological variables and respective tests:

| | | | |
|---|---|---|---|
| 1. | Positive Breath Holding Capacity | Clip on Nose Test | In seconds (Buteyko, 1991) |
| 2. | Negative Breath Holding Capacity | Clip on Nose Test | In seconds |
| 3. | Resting Heart Beat | Pulse counting & stop watch Test | Beats per minute |
| 4. | Systolic Blood Pressure | Automatic Digital Blood Pressure Cuff | mm Hg |
| 5. | Diastolic Blood Pressure | Automatic Digital Blood Pressure Cuff | mm Hg |

**METHODS**

**Physical Tests**

(1) SPEED: Measured through 50-meter Sprint Test

In order to avoid any injury due to lack of warm up, test subjects were told to have proper warm up session of 15 minutes during which they undertook light jogging, small strides, stretching exercises. Test subjects were also made aware about the initiation and finish of the sprint.

(2) AGILITY: Measured through SEMO Agility Test

This test was administered on a basketball court with clear markings on floor. The test area is demarcated into a square with four sport-training cones on four corners, A, B, C and D. The width of the square measures 12 feet along the straight base line and 19 feet lengthwise. Two red colored cones were place between at the front end i.e. point A and point B in a straight line and same colored cones of yellow color were placed at back end of square and designated as point C and point D, again in straight line to each other. The different color code of cones is use this used to simplify the test as athletes have to sprint forward to the same color cones and once going backward they backpedal to same color cones. The athletes have to start from starting point marked as A and have to stand just outside the square near A with his back towards back line of the square as seen in Fig 1. On command of 'GO' from coach, players have to side step towards point 'B' along the front line of square. After reaching point 'B', the players have to pass the cone placed there from outside and continue to back pedal diagonally towards point 'D'. Then player has to pass the cone placed at point 'D' from inside and to sprint towards the cone placed at point 'A', passing the cone at point 'A' from outside and again has to backpedal diagonally towards point 'C'. After crossing the cone placed at point 'C' from inside, the athlete sprints forward to Point 'B' in straight line and from outside the cone placed at 'B', player will continue to side step towards starting point 'A' which is also the finish point. It is important to mention that a player has to undertake this entire test facing forward. To make player feel comfortable with test and for avoiding mistakes due to lack of understanding players were given opportunity to run it for practice once before actual test. Scoring: The fastest time to the nearest 0.1 sec of two trials was taken as the final time.

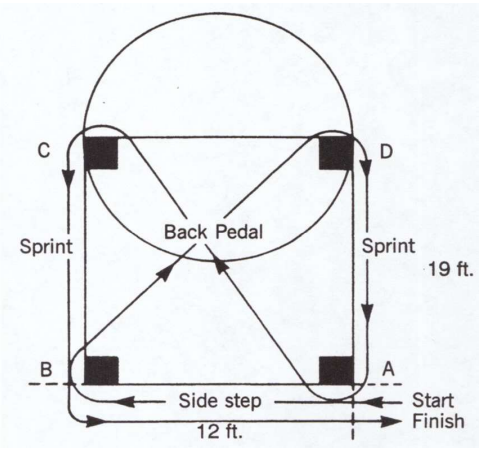

Figure 1. SEMO Agility Test

(3) ABDOMINAL STRENGTH & ENDURANCE: Measured through One-Minute Sit-Up Test

This is important in wrestling, as core strength is most essential in lifts and throws involved in most techniques. Process: The wrestlers were asked to lie down on a mat on their back with bent knees and feet on ground. It was made sure that the heel of wrestler shall not be more than 30 centimeters away from their buttocks. The subject put his hands behind their heads with fingers netted together and elbows placed on mat. To keep the subject steady, his feet were held by a partner. On the direction of 'Go' the player has to bring his head up and with elbows touching the thighs while using his abdominal muscles.

(4) EXPLOSIVE STRENGTH: Measured through Standing Broad Jump

The wrestler stands with toes up to the take off line. The wrestler jumps forward by extending his knees and swinging his arms in forward and upward direction at same time to gather momentum and landing with both feet on ground. The distance measured from inner edge of take off line to the nearest heel impression of player in the pit after landing. One practice jump was allowed to familiarize players with jump process. Three jump attempts were allowed for each wrestler, with the best distance jumped by the player in three attempts the final score.

(5) AEROBIC ENDURANCE: Measured through Cooper Test
Aim: To cover as much distance as possible by running/walking in 12 minutes time period. The players were advised to maintain a steady pace. Cooper test was administered on a 400-meter athletics track. This 400-meter track was divided in sixteen equal parts such that each is of 25 meters. All the athletes were gathered at starting line and necessary directions were given such as players should run/walk constantly for a total duration of 12 minutes. During the test there were regular announcements about the time remaining so that athletes could have an idea of the distance covered and time left. Each complete lap of each individual player was noted down. After completion of 12 minutes time period, players were directed to stop at their respective positions and their stopping place distance was measured from the starting line in case of less than a complete lap.
Score: The total distance covered by each player in the 12 minutes was calculated in meters and this was taken as the score.

(6) FLEXIBILITY: Measured through Sit and Reach Test

1. Sit on the floor with the hips, back, and head against a wall, and the legs fully extended and the bottom of the feet against the sit and reach box.
2. Place hands one on top of the other and reach forward as far as possible without letting the head and back come off the wall. Mark the distance at which your fingers reach as the zero point of the ruler.
3. Now your head and back can come off the wall. Gradually reach forward three times, the third time stretching forward as far as possible and hold the position for at least 2 seconds, making sure that during the test the backs of the knees are kept flat against the floor.
4. Measure the distance between the starting point, and the reached point.
5. The best score in centimeter of total three attempts was taken as final score.

Figure 2. Sit and Reach Test Performance

**Psychological Tests**
(1) COMPETITION ANXIETY: Measured trait anxiety of wrestlers through Sports Competition Anxiety Test (SCAT). To access the competition anxiety of players as there is direct relationship between anxiety levels and sports performance of a player. Higher anxiety levels are detrimental for good sports performance. The wrestlers were instructed to read each question of the test which asked them to indicate how they generally felt in competitive sports situations and respond using a three-point ordinal scale - Rarely, Sometimes and Often, choosing one among three.
Score: Total score of SCAT ranges from 10 to 30 where 10 stands for low anxiety levels and 30 being the highest.

| SCAT Score | Analysis |
|---|---|
| Less than 17 | Low level of Anxiety |
| 17 to 24 | Average level of Anxiety |
| More than 24 | High level of Anxiety |

(2) CONCENTRATION: Measured through Grid Concentration test
Process: The Grid Concentration Test Sheet contains counting from ‘00’ to ‘99’ in jumbled form in ten rows and ten columns in each row. Players have to use their concentration power to locate the counting in that grid and strike them out with pen in a sequence starting from 00, 01, 02, 03 and so on in a consecutive manner. Players have to strike out as many numbers as possible in one minute while try to maintain the sequence of counting as far as possible. Higher the number of consecutive numbers strike off by candidate, higher is level of his concentration.

Score: The total number of counting struck off by candidate was taken as score of the candidate. In case of a sequence broken, or any consecutive number being missed by a wrestler, one mark was reduced from the cumulative score.

(3) SPORTS SELF-CONFIDENCE: Measured through the Sports Self-Confidence Inventory. Sports self-confidence can play a vital role in sports, and especially so in combat sports like wrestling. Wrestlers were told that there are no right or wrong answers on the test, and they are to base their response on their personal judgement, and on the basis of how candidate really feels, and not how candidate likes to feel. The Sports Self Confidence Inventory contains 13 test items. Each question contains nine possible options and each candidate has to mark one of the options by placing a circle on it on basis of how they feel generally about their confidence level in that situation asked in question. Candidates were asked to respond to the questions of the test on basis of how confident they generally feel when they compete in their sports. Candidates were asked to compare their own self-confidence to the most self-confident athlete they know. In each question candidates were asked compare their confidence in a particular condition to that of the most confident athlete candidates knows. For example, in question number 3 candidates is asked, "Compare your confidence in your ability to perform under pressure to the most confident athlete you know". The options range from 1 to 9 where 9 stands for high confidence level and 1 stands for low confidence level. Score: The cumulative sum of all the option values marked by candidate becomes score of that individual candidate. On the basis of raw score, the following categories are recommended:

| Raw Score | Classification |
|---|---|
| 13 to 47 | Low Sports Self-Confidence |
| 48 to 82 | Moderate Sports Self-Confidence |
| 83 to 117 | High Sports Self-Confidence |

**Physiological Tests**

(1) POSITIVE BREATH HOLDING CAPACITY:

Aim: To hold breath as long as possible after taking a maximal inhalation. Process: The wrestler was asked to shut his nostrils with help of tightly placed nose clip. Following this, the wrestler was asked to inhale to their maximum capacity using only their mouth. As soon as the subject stops inhaling the and closes his lips, the stopwatch was started to record time period for which player could hold his breath. The time was stopped as soon as player opens his lip to exhale air. Score: The total duration of time in seconds for which players withholds his breath after a maximal inhalation is taken as the score.

(2) NEGATIVE BREATH HOLDING CAPACITY:

Aim: To hold breath as long as possible after exhaling breath to full capacity. Process: The player was asked to shut his nostrils with help of tightly placed nose clip. Following this, the subject was asked to exhale air to their maximum capacity using only their mouth. As soon as the player stops exhaling air and closes his lips, the stopwatch was started to record time period for which player could withhold his breath. The time was stopped as soon as player opens his mouth to inhale air. Score: The total duration of time in seconds for which the wrestler withholds his breath after a maximum exhalation is taken as the score.

(3) RESTING HEART BEAT: Measured through pulse count at the radial artery for one minute.

Directions: Test subjects were told to be completely calm and fully rested before taking this test. To ensure that players are completely rested and calm this test was administrated between 6AM to 7AM while players were resting in their bed after a full night sleep. The wrestlers were visited in their living quarters. To record the heartbeat, the pulse rate was recorded by palpation at the radial artery in a minute time period. Score: The total number of pulse beats per minute is considered as score of subjects in this test.

(4) SYSTOLIC BLOOD PRESSURE:

(5) DIASTOLIC BLOOD PRESSURE:

Measured through Automatic Digital Blood Pressure Monitor (Omron Company, Model BP710). Directions: Players were told to be completely calm and fully rested before taking this test. The individual is instructed to sit on a chair and be in a relaxed position, remove any tight-fitting clothes on left arm, to remain still and not talking during the test. Process: To ensure the optimum result this test was conducted in morning after a full night sleep so that subject is without any stress. The test subject made to sit in a chair with both feet flat on ground and left arm is to be extended out resting on a table so that arm cuff of the machine is at level of heart. The standard prescribed batteries were installed in machine and machine was set up for test. Score: Systolic and Diastolic Blood Pressure figures (mm Hg) are displayed on screen.

**Statistical Procedures**

After the collection of values for the purpose of the analyses, the following statistical procedures were employed, in first step, descriptive statistics was employed in which Mean; SD, were computed for both groups. The required statistical calculations were computed with the SPSS software. Then, both groups were tested to observe the differences among the selected variables using t tests.

**ANALYSIS AND RESULTS**

The Russian wrestlers scored significantly better than their Indian counterparts on six of the tested variables (see table 1). Of the physical variables, Russian wrestlers demonstrated superior performance in Speed, Agility, Explosive Strength and Flexibility. In Abdominal Strength, Though the Russian wrestlers displayed higher level of abdominal strength, the t-value of 0.061 did not reach significance. Only in Endurance were the Indian wrestlers superior.

Table 1 Performance Data from all Variables (mean± standard deviation)

| Physical variables | | Indian Wrestlers | Russian Wrestlers |
|---|---|---|---|
| | Speed 50 Meter Sprint (s) | 6.7±0.63 | 6.0±0.66 * |
| | Agility SEMO Agility Test (s) | 11.3±0.87 | 10.4±0.67 * |
| | Abdominal Strength 1-Minute Sit-up Test | 51.3±7.99 | 57.1±6.36 |
| | Explosive Strength Standing Broad Jump (cm) | 180.3±5.69 | 217.5±18.77 * |
| | Endurance Cooper Test (meters) | 2800.0±261.9 * | 2566.7±277.43 |
| | Flexibility Sit and Reach Test (cm) | 14.3±1.71 | 17.3±1.44 * |
| Psychological variables | | | |
| | Competition Anxiety (SCAT) | 22.9±2.61 | 16.8±3.41 * |
| | Grid Concentration Test | 10.3±2.02 | 11.1±2.11 |
| | Sports Self-Confidence Inventory | 90.3±5.40 | 103.1±10.01 * |
| Physiological variables | | | |
| | Positive Breath Holding capacity (s) | 60.6±13.84 | 61.9±12.01 |
| | Negative Breath Holding capacity (s) | 29.9±5.0 | 30.9±5.63 |
| | Resting Heart Rate (bpm) | 50.6±3.53 | 48.9±4.14 |
| | Systolic Blood Pressure (mm Hg) | 121.7±4.92 | 117.9±5.42 |
| | Diastolic Blood Pressure (mm Hg) | 78.8±3.77 | 81.7±4.44 |

* Significant difference $p<0.05$

Among the psychological parameters, the Russian wrestlers demonstrated less Competition Anxiety and greater Sports Self-Confidence. Both Indian and Russian wrestlers possess similar levels of mental concentration.

In the physiological parameters, results from the five main variables demonstrated no significant differences between the two groups.

**CONCLUSIONS/ADVICE FOR COACHES**

It clearly shows that Indian wrestlers need to work on their physical development. At the same time, Russian trainers can examine if there is a need for more aerobic endurance. This is always a delicate balance between the concurrent training for both explosive power and endurance, that is demanded in wrestling.

There is need for an emphasis on improving psychological training of Indian wrestlers which is demonstrated in the lower anxiety and greater self-confidence of Russian wrestlers. Thus, this information can contribute to readjust and refine the national level coaching strategies for both national teams.

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