

A Study of Spirometer and Cooper's 12 min. Run and Walk Physiological Measurement in Relation to the Performance of Free Style Wrestlers

VIRENDER SINGH

Research Scholar

Panjab University, Chandigarh (U.T.) India

ABSTRACT

Introduction: The performance of players in various sports may be influenced by the anthropometric, physical and the physiological characteristics and may also aid in determining a suitable physique required for a sport.

Methods: The physical variables such Spirometer and Cooper's 12 min. Run and Walks have been selected to assess the physical condition of the wrestler's. A survey type study has been designed for descriptive analysis of wrestler's physical characteristics. Data was collected from 30 male wrestlers of each weight categories *i.e.* 57 kg, 61 kg, 65 kg, 70 kg and 74 kg..

Results: The results revealed that the f-value of different weight category of variable Spirometer and Cooper's 12 min. Run and Walk. The f-value of the ANOVA came out to be 3.86 and 3.34 respectively ($P < 0.01$) which was highly significant at 0.01 level of confidence.

Conclusion: The correlation between performance score and physical variables among the players of 57, 61, 65, 70 and 74kg weight categories. The f-value Spirometer of the ANOVA came out to be 3.86, which was significant at 3.34 levels. The f-value (Cooper's 12 min. Run and Walk) of the ANOVA came out to be 0.54, ($P < 0.01$) which was not significant at 0.01. No significant relationship was found with performance score.

Key Words : Spirometer, Physiological measurement, Free style wrestlers

INTRODUCTION

Akhara which is made of soil used for practicing wrestling and covered by thousands of people for enjoying wrestlers bout. Wrestling competition were organized throughout the year in traditional ways and winner were honored with cash price. Since times immemorial, the Akharas of wrestlers have been divided into two categories. One, where wrestlers take exercise as a matter of routine, the other is formed in fairs or tournaments. Though both kinds of Akharas have physical strength as motive force, yet one may discern profound difference between them. The main motive of domestic Akhara is to strengthen wrestlers and to train them in tactics of the game of wrestling. Wrestlers take first lesson in fundamentals of wrestling in these Akharas and scale supreme heights in their careers. Since these akhara are related to sweet-sour memories of their boyhood and

How to cite this Article: Singh, Virender (2018). A Study of Spirometer and Cooper's 12 min. Run and Walk Physiological Measurement in Relation to the Performance of Free Style Wrestlers. *Internat. J. Appl. Soc. Sci.*, 5 (12) : 2307-2311.

youth, the wrestlers develop a sort of personal bond as well as a longing for these spots. When a wrestler attains fame, his arena naturally gets a name. The Akharas are named after their founders; holy men or wrestlers. It is here that a wrestler imbibes the ethics of the game and learns how to respect elders where-by he gets an opportunity to elicit some strategy from senior wrestlers. This stands a wrestler in good stead to refine or polish his style, wrestlers from the some akhara do not indulge in a bout in fair arena because they consider themselves as fellow disciples of the same teacher (ustad). Many ideas sprout up in the minds of the wrestlers to bring laurels to their akhara because they have personal bonds with domestic akhara. The other kinds of arena come into being at the time of fairs or tournaments. These are not meant for practice but for a struggle of life and death. These are formed for the only purpose of testing strength or prowess of the wrestlers. It becomes a matter of joy for the victorious wrestlers and his akhara and a matter of humiliation for the vanquished one. But, at the same time, it inspires the defeated wrestler to gain more power and skill (Sekhon, 2007).

From a physiological point of view, the general assessment protocol used demonstrated that an ideal VO₂ max level is one of the significant parameter which determines highest performance in wrestlers. Therefore wrestlers training program target cardiorespiratory system. With regards to the wrestler's anaerobic profile, results revealed that anaerobic power and capacity are important variables for achieving high-level wrestling performance and accurately discriminate between successful and less-successful wrestlers regardless of their age-category, weight classes, and wrestling-style. Wrestlers compete in a challenging environment involving repetitive bouts of high-intensity actions (e.g., attacks and counterattacks) alternated by sub-maximal work of low intensity activity and/or pause (Horswill, 1992, Yoon, 2002).

METHODOLOGY

The performance of players in various sports may be influenced by the anthropometric, physical and the physiological characteristics and may also aid in determining a suitable physique required for a sport. Studies from various parts of the world have assessed the anthropometric and physiological profile of players from different sports, but there is paucity of data on these variables in wrestling players from Haryana therefore an attempt has been made to assess the Physical variable that might be associated to performance in male wrestling players. The physical variables such as speed and explosive strength have been selected to assess the physical condition of the wrestler's. To test these motor abilities Spirometer and Cooper's 12 min. Run and Walk have been selected respectively. A survey type study has been designed for descriptive analysis of wrestlers' physical characteristics.

The subjects of the present study has been purposively selected from the inter college level, University level, Senior State level, National Level and international players. Data was collected from 30 male wrestlers of each weight categories *i.e.* 57 kg, 61 kg, 65 kg, 70 kg and 74 kg.

RESULTS AND DISCUSSION

Table 1 shows the descriptive statistics of Spirometer among different weight categories of freestyle wrestler. The table revealed that mean, SD, scores for Weight 57 came out to be 2.63 and 0.66, respectively. The table further revealed that mean score for Weight 61 was 2.85 and SD was 0.66. Spirometer's mean score for Weight 65 came out to be 3.02 and SD was 0.73. For Weight 70, mean score was 2.92 and SD was 0.73. Mean Score for Weight 74 was 3.28 and SD was 0.54.

| Weight Categories | N | Mean | Std. Deviation | Std. Error | 95% Confidence Interval | | Minimum | Maximum |
|-------------------|-----|------|----------------|------------|-------------------------|-------|---------|---------|
| | | | | | Lower | Upper | | |
| Weight 57 | 30 | 2.63 | 0.66 | 0.12 | 2.38 | 2.88 | 1 | 4 |
| Weight 61 | 30 | 2.85 | 0.66 | 0.12 | 2.60 | 3.10 | 1 | 4 |
| Weight 65 | 30 | 3.02 | 0.73 | 0.13 | 2.74 | 3.29 | 1 | 5 |
| Weight 70 | 30 | 2.92 | 0.73 | 0.13 | 2.65 | 3.20 | 1 | 4 |
| Weight 74 | 30 | 3.28 | 0.54 | 0.10 | 3.08 | 3.48 | 2 | 4 |
| Total | 150 | 2.94 | 0.69 | 0.06 | 2.83 | 3.05 | 1 | 5 |

Finally, the mean score for total sample was 2.94 and SD was 0.69. The graphical representation of the responses has been presented in the Fig. 1.

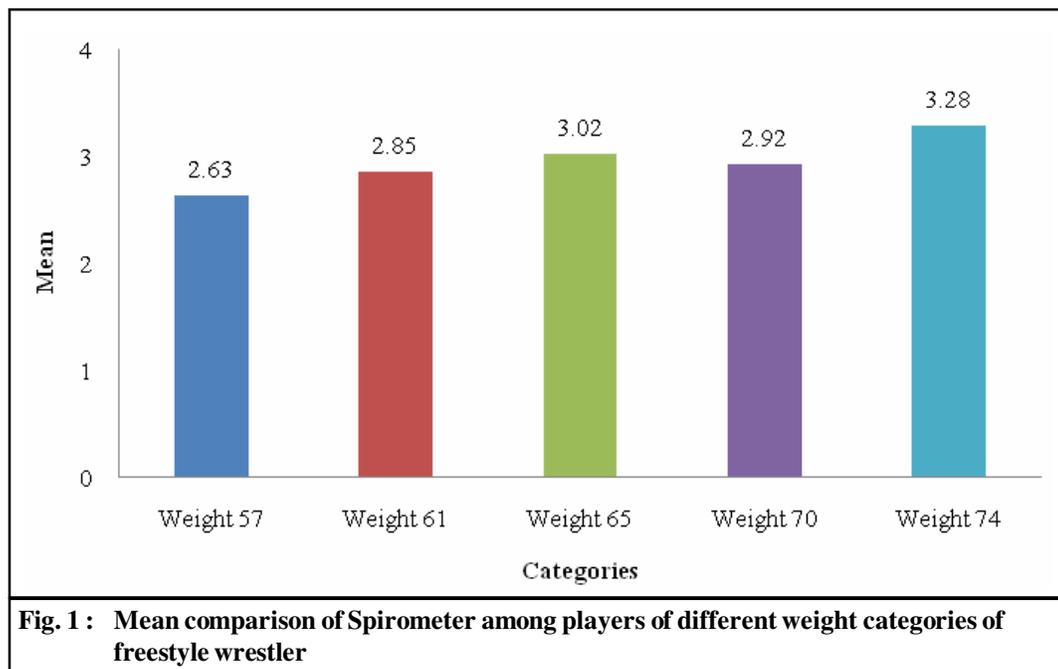


Table 2 revealed the Analysis of Variance (ANOVA) of different weight categories of freestyle wrestler on Spirometer. The sum of squares of between groups came out to be 6.88 and for within groups sum of squares was 64.57. The f-value of the ANOVA came out to be 3.86, which was significant on 0.01 level of confidence.

| Source of Variance | Sum of Squares | df | Mean Square | F-value | p-value |
|--------------------|----------------|-----|-------------|---------|---------|
| Between Groups | 6.88 | 4 | 1.72 | | |
| Within Groups | 64.57 | 145 | 0.45 | 3.86 | 0.01** |
| Total | 71.44 | 149 | | | |

**Significant at 0.01 level

Table 3 shows the descriptive statistics of Cooper’s 12 min, run/walk among different weight categories of freestyle wrestler. The table revealed that mean, SD, scores for Weight 57 came out to be 2004.67 and 170.41, respectively. The table further revealed that mean score for Weight 61 was 2064.17 and SD was 162.82. Cooper’s 12 min. run/walk’s mean score for Weight 65 came out to be 2018.67 and SD was 190.64. For Weight 70, mean score was 2064.33 and SD was 203.01. Mean Score for Weight 74 was 1922.33 and SD was 139.00. Finally, the mean score for total sample was 2014.83 and SD was 179.99. The graphical representation of the responses has been presented in the Fig. 2.

Table 3 : Descriptive statistics of Cooper's 12 min. run/walk among players of different weight categories of freestyle wrestler

| Weight Categories | N | Mean | Std. Deviation | Std. Error | 95% Confidence Interval | | Minimum | Maximum |
|-------------------|-----|---------|----------------|------------|-------------------------|---------|---------|---------|
| | | | | | Lower | Upper | | |
| Weight 57 | 30 | 2004.67 | 170.41 | 31.11 | 1941.03 | 2068.30 | 1700 | 2390 |
| Weight 61 | 30 | 2064.17 | 162.82 | 29.73 | 2003.37 | 2124.96 | 1800 | 2415 |
| Weight 65 | 30 | 2018.67 | 190.64 | 34.81 | 1947.48 | 2089.85 | 1700 | 2450 |
| Weight 70 | 30 | 2064.33 | 203.01 | 37.06 | 1988.53 | 2140.14 | 1710 | 2410 |
| Weight 74 | 30 | 1922.33 | 139.00 | 25.38 | 1870.43 | 1974.24 | 1700 | 2180 |
| Total | 150 | 2014.83 | 179.99 | 14.70 | 1985.79 | 2043.87 | 1700 | 2450 |

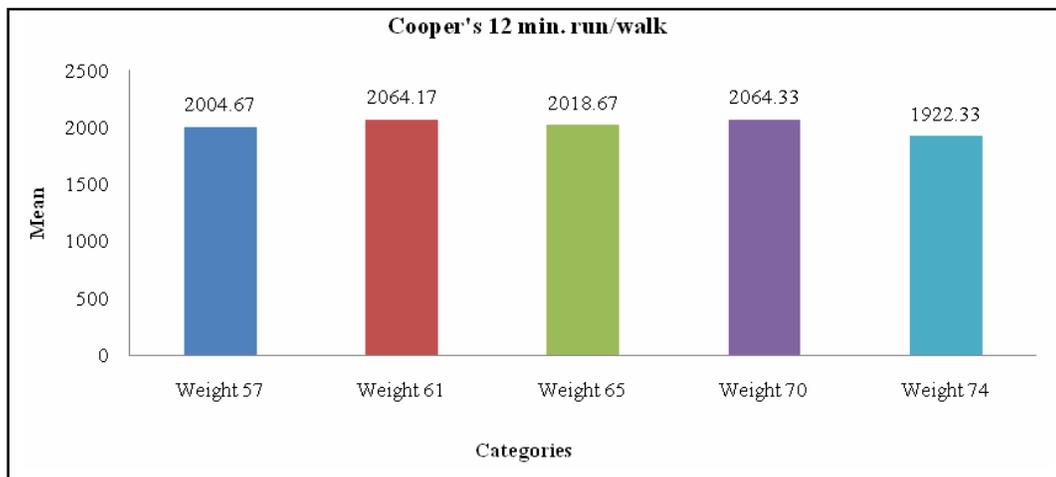


Fig. 2 : Mean comparison of Cooper's 12 min. run/walk among players of different weight categories of freestyle wrestler

Table 4 revealed the Analysis of Variance (ANOVA) of different weight categories of freestyle wrestler on Cooper’s 12 min. run/walk. The sum of squares of between groups came out to be

Table 4 : Analysis of Variance (ANOVA) of Cooper's 12 min. run/walk among players of different weight categories of freestyle wrestler

| Source of Variance | Sum of Squares | df | Mean Square | F-value | p-value |
|--------------------|----------------|-----|-------------|---------|---------|
| Between Groups | 406740.00 | 4 | 101687.50 | | |
| Within Groups | 4420370.83 | 145 | 30485.32 | 3.34 | 0.01** |
| Total | 4827120.83 | 149 | | | |

**Significant at 0.01 level

406740.00 and for within groups sum of squares was 4420370.83. The f-value of the ANOVA came out to be 3.34, which was significant on 0.01 level of confidence.

Conclusion:

The f-value Spirometer of the ANOVA came out to be 3.86, which was significant at 3.34 levels. The f-value (Cooper's 12 min. Run and Walk) of the ANOVA came out to be 3.86, (P<001) which was significant at 0.01. The correlation between performance score and physical variables among the players of 57, 61, 65, 70 and 74 kg weight categories, significant relationship was found with performance score. The study done by Chaabene *et al.* (2017) has been in line with the present study as he also revealed that Physical fitness variables such as maximal dynamic strength, isometric strength, explosive strength, and strength endurance are very closely related to high-level wrestling performance. However, as the identification of physical variables relevant to success is important for the selection of young athletes and the preparation of appropriate training programmes.

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