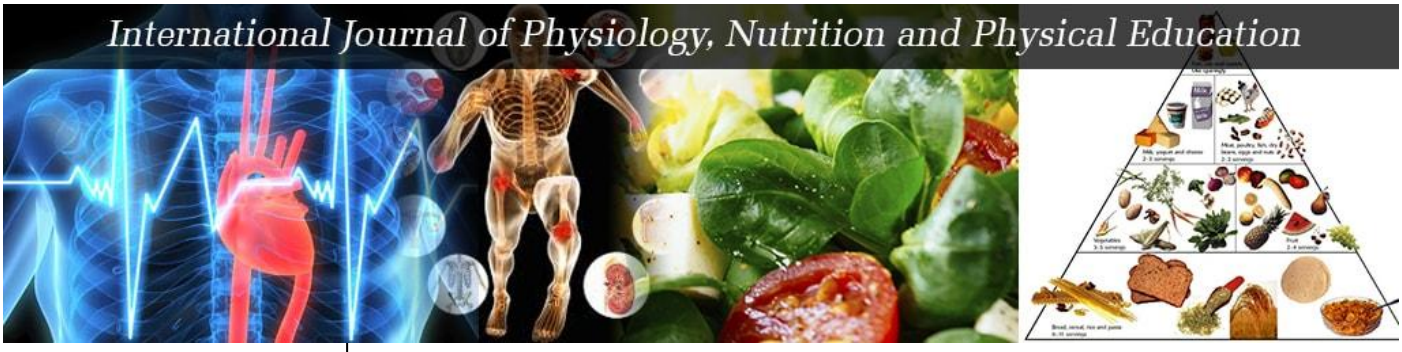

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A study of speed and explosive strength in relation to the performance of free style wrestlers

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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 as speed and explosive strength 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 speed and explosive strength of the ANOVA came out to be 1.88 and be 0.99 respectively, which was not significant on 0.01 level of confidence.
Conclusion: The correlation between performance score and physical variables of the players of 57, 61 and 70 weight categories no significant relationship was found with performance score.

Keywords: explosive strength, free style wrestlers

Introduction
Wrestling in modern India is concentrated in the Indian states like Uttar Pradesh, Tamil Nadu, Punjab and Haryana. Wrestlers from these states won many medals at national and internal level. Indian wrestler won medal in Olympics also and there is a big list of Indian wrestlers who medal at international platform. Sakshi Malik, Sushil Kumar Solanki, Udey Chand, Satender Dagar, Gobar Guha, Jatindra Charan Goho, Ambika Charan Guha, Khashaba Dadasaheb Jadhav, Yogeshwar Dutt, Ghulam Muhammad, Dara Singh and Geeta Phogat are considered as the all-time famous and popular wrestlers in India from Independence.
In filled of combat sport pro wrestling is big jump and became very popular in such short span. It was started in year 2015 in India and it was initiated by wrestling federation of India and pro sportily. Pro wrestling is remarkable a competition which started in India and in debut year approximately fifteen crore rupees were invest including prize of three crore. Pro wrestling competition has six franchisees which includes cities of all over India. Each group will have 9 players – 5 Indians, 4 outside, 5 men, 4 ladies. In the debut year, PWL will include an aggregate of 18 ties – 15 in the class stage, 2 semi-finals and the Grand Finale. Each tie will be challenged on the best of 7 session's organizations; curiously every one of the seven sessions will be challenged in the League Phase. PWL ensures at least 150 sessions. The League will be played under the PWL Rules, fitting in with the United World Wrestling and Wrestling Federation of India rules.
Krestovnikov (1974) [2] highlighted the effects of wrestling on body and stated that during a bout as a result of fatigue wrestlers lactic acid increased from 9.4-13.7 mg. percent to 18.9-51.4 mg. percent and sugar increased from 97-111 mg. percent to 141-165 mg. percent. In blood concentration of chlorides increased after a short bout but reduced after a prolonged bout. Hemoglobin increased about 4 percent. Karpovich (1935) [3] studied the effects of wrestling on the white blood corpuscles and stated that 2 to 4 minutes wrestling match produced a lymphocytic reaction, characterized by an increase in lymphocytes, and that matches over four minutes generally produced a neutrophil reaction, characterized by an increase in neutrophils. Longer he exercise one do more uniform the extraction of all kinds of

corpuscles from the Storage places. Coaches and wrestlers both get the information related to present conditions of wrestling athletes through the physical measurements such as fitness test and physiological test. Measurement of such parameters helps the coaches to compare that capacity with recorded values of elite athletes of wrestling of same age group. The use of physical fitness tests for the measurement of the current status of the wrestler can provide both the wrestler and coach with information relative to the wrestler's current physiologic capability and can allow them to compare that capacity with reference values from appropriate peer groups. Although assessment of physical and physiological status of wrestlers help to know the strength and weakness of the wrestler's and can be used to follow the appropriate training methods (Mirzaei *et al*., 2009) [4].

Methods and Procedure

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 theses motor abilities 50M Dash and standing Broad Jump 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.

Table 1: Descriptive statistics of 50M DASH among players of different weight categories of Wrestlers

Category	N	Mean	Std. Deviation	Std. Error	95% Confidence Interval		Minimum	Maximum
					Lower	Upper		
Weight 57	30	6.57	0.43	0.08	6.41	6.73	6	8
Weight 61	30	6.79	0.38	0.07	6.65	6.93	6	8
Weight 65	30	6.58	0.27	0.05	6.48	6.68	6	7
Weight 70	30	6.72	0.40	0.07	6.57	6.87	6	7
Weight 74	30	6.70	0.42	0.08	6.55	6.86	6	7
Total	150	6.67	0.39	0.03	6.61	6.74	6	8

Table 1 shows the descriptive statistics of 50 mtr DASH among different weight categories. The table revealed that mean, SD, scores for Weight 57 came out to be 6.57 and 0.43, respectively.

The table further revealed that mean score for Weight 61 was 6.79 and SD was 0.38. 50 mtr DASH's mean score for Weight 65 came out to be 6.58 and SD was 0.27. For Weight 70, mean score was 6.72 and SD was 0.40. Mean Score for Weight 74 was 6.70 and SD was 0.42. Finally, the mean score for total sample was 6.67 and SD was 0.39.

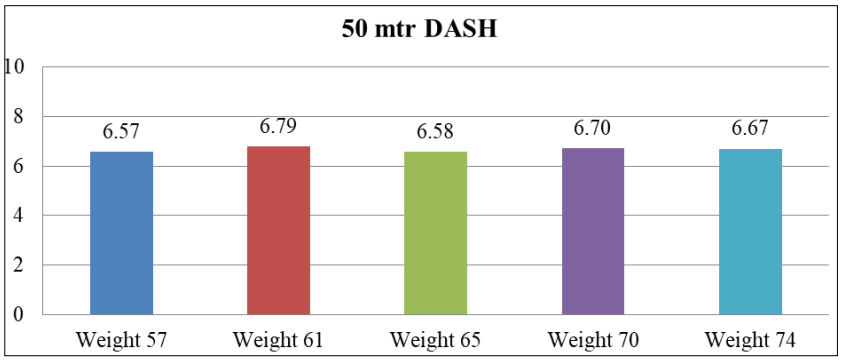

Fig 1: Mean comparison of 50m dash among different weight categories of wrestlers.

Table 2: Analysis of Variance (ANOVA) of 50m DASH, value among different weight categories of Wrestlers

Source of Variance	Sum of Squares	df	Mean Square	F-value	p-value
Between Groups	1.10	4	0.28	1.88	0.12
Within Groups	21.29	145	0.15		
Total	22.40	149			

Table 2 revealed the Analysis of Variance (ANOVA) of different weight categories on 50 mtr DASH. The sum of squares of between groups came out to be 1.10 and for within groups sum of squares was 21.29. The f-value of the ANOVA came out to be 1.88, which was not significant on 0.01 level of confidence.

Table 3: Descriptive statistics of standing board jump among different weight categories of Wrestlers

	N	Mean	Std. Deviation	Std. Error	95% Confidence Interval		Minimum	Maximum
					Lower	Upper		
Weight 57	30	2.21	0.17	0.03	2.15	2.27	2	3
Weight 61	30	2.17	0.12	0.02	2.12	2.21	2	2
Weight 65	30	2.23	0.12	0.02	2.18	2.27	2	2
Weight 70	30	2.17	0.15	0.03	2.12	2.22	2	3
Weight 74	30	2.18	0.16	0.03	2.12	2.24	2	2
Total	150	2.19	0.14	0.01	2.17	2.21	2	3

Table 3 shows the descriptive statistics of standing board jump among different weight categories. The table revealed that mean, SD, scores for Weight 57 came out to be 2.21 and 0.17, respectively. The table further revealed that mean score for Weight 61 was 2.17 and SD was 0.12. Standing broad jump's mean score for Weight 65 came out to be 2.23 and SD was 0.12. For Weight 70, mean score was 2.17 and SD was 0.15. Mean Score for Weight 74 was 2.18 and SD was 0.16. Finally, the mean score for total sample was 2.19 and SD was 0.14.

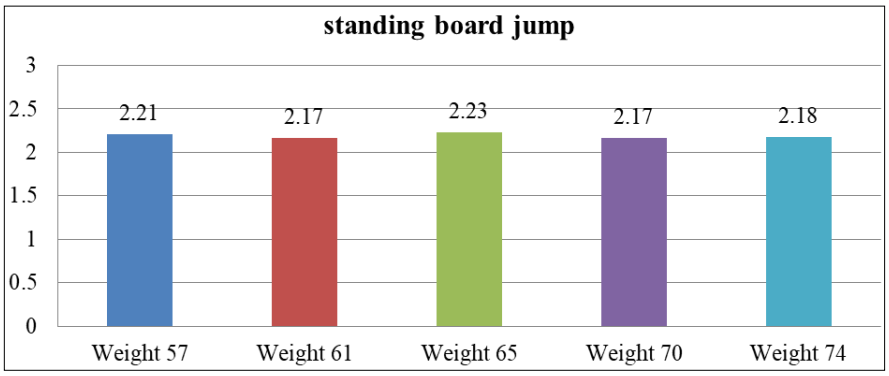

Fig 2: Mean comparison of standing board jump among different weight categories of players

Table 4: Analysis of Variance (ANOVA) of standing board jump value among players of different weight categories

Source of Variance	Sum of Squares	df	Mean Square	F-value	p-value
Between Groups	0.08	4	0.02	0.99	0.41
Within Groups	3.03	145	0.02		
Total	3.11	149			

**Significant at 0.01 level

Table 4 revealed the Analysis of Variance (ANOVA) of different weight categories on standing board jump. The sum of squares of between groups came out to be 0.08 and for within groups sum of squares was 3.03. The f-value of the ANOVA came out to be 0.99, which was not significant on 0.05 level of confidence.

Conclusion

The f-value (Speed ability-50m DASH) of the ANOVA came out to be 1.88, which was not significant on 0.01 level of confidence. The f-value (Explosive strength-standing board jump) of the ANOVA came out to be 0.99, which was not significant on 0.05 level of confidence. The correlation between performance score and physical variables of the players of 57, 61 and 70 weight categories no significant relationship was found with performance score. The study done by Chaabene, H (*et al.*) 2017 [1] 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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