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Impact of battle rope and Bulgarian bag high intensity interval training protocol on selected strength and physiological variables among school level athletes

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Abstract

The purpose of this study was to investigate the Impact of Battle rope and Bulgarian bag high intensity interval training protocol on selected strength and physiological variables among school level athletes. It was hypothesized that there would be a significant impact of Battle rope and Bulgarian bag high intensity interval training protocol on selected strength and physiological variables among school level athletes. For the present study, 45 male athletes from various schools of Idukki District from Kerala were selected as subjects at random and their age ranged from 13 to 17 years. They were divided into three equal groups consist of 15 each, group I underwent Battle rope training, group II underwent Bulgarian bag training. The Battle rope and Bulgarian bag training group participated in the training for 5 days in a week, one session per day and for 8 weeks each session lasted 90 minutes. Group III acted as control group. The control group did not participate in any special training programme apart from the regular physical activities as per the curriculum. In this study selected strength and physiological tests were carried out on each students. These included Grip strength assessed by Handgrip dynamometer and Vital capacity assessed by web spirometer. All the subjects of the three groups were tested on selected dependent variable at prior and immediately after the training programme. The analysis of covariance (ANCOVA) was used to analyze the significant difference, if any among the adjusted post-test means of experimental and control group on each variable separately. Whenever the obtained 'f' ratio for adjusted post-test means was to found to be significant, the scheffe's test was applied, as a post hoc test to determine the paired mean differences. In all cases 0.05 level of confidence was fixed as the level of significance to test the 'f' ratio obtained by the analysis of covariance, the result of the study indicated that Battle rope and Bulgarian bag training can be used to enhance Grip strength and Vital capacity among school level athletes.

Keywords: Battle rope, Bulgarian bag, Grip strength, Vital capacity.

1. Introduction

1.1. Battle Rope

The Battling Ropes System was created and developed by John Brookfield. John is a multiple world record holder and the author of the popular book, *Mastery of Hand Strength*. Battle ropes are commonly used as a high intensity interval training (HIIT) tool to develop an athlete's strength, power, explosiveness, as well as their anaerobic and aerobic endurance.

Battling Ropes or heavy rope training gives the entire body countless benefits. The great thing about training with the Battling Ropes is that movements and techniques can be modified for exercisers of just about any fitness level; from using both hands to grip and work only one end of the rope, to adding more advanced movements that include lower body movements along with the upper body work.

Battle ropes come in all shapes and sizes, typically ranging from 26-50ft in length, and are anywhere between 1 to 2 inches thick. Their weight can vary greatly, depending on the length and thickness of the rope. When used in training, the rope is wrapped around an anchor point, and an athlete holds the rope at its end point, which is usually wrapped in thick tape.

1.2. Bulgarian Bag

The Bulgarian bag also known as the Bulgarian training bag is a crescent-shaped exercise equipment used in strength training, plyometric weight training, cardiovascular

training, and general physical fitness. The bags are made of leather or canvas and filled with sand; they weight from 11 pounds (5.0 kg) to 50 pounds (23 kg) and have flexible handles to allow for both upper and lower body training, and for building grip strength.

The Bulgarian bag was invented by Ivan Ivanov at around 2005. Ivanov, a former Bulgarian Greco-Roman Olympic athlete, was working as a U.S. Olympic Greco-Roman wrestling coach at the Olympic training centre in Marquette, Michigan and was looking for a training tool that would allow his wrestlers to improve explosive actions and dynamic movements involved in pushing, twisting, swinging, pulling, bending, rotating, squatting, lunging, and throwing. Bulgarian bag breaks the tradition with static resistance devices such as free weights, by using accelerating and deceleration movements to swing and spin the Bag at various angles to athlete’s body. This results in the Bulgarian bag’s ability to increase overall body strength and agility. The unique design of the Bulgarian bag makes it incredibly functional and versatile.

1.3. Objective of the Study

The Purpose of the study was to find out the Impact of Battle rope and Bulgarian bag High intensity interval training protocol on selected strength and physiological variables among school athletes.

1.4. Hypothesis

It was hypothesized that there would be a significant improvement on the selected strength variable due to Battle rope training.

It was hypothesized that there would be a significant improvement on the selected physiological variable due to Battle rope training.

It was hypothesized that there would be a significant improvement on the selected strength variable due to Bulgarian bag training.

It was hypothesized that there would be a significant improvement on the selected physiological variable due to Bulgarian bag training.

1.5. Methodology

To achieve this purpose of the study, forty five (N=45) school men athletes were randomly selected as subjects from varies Schools of Idukki Districts from Kerala were selected as subjects at random and their age ranged from 13 to 17 years. They were divided into three equal groups consist of 15 each, Group I underwent Battle rope training, Group II underwent Bulgarian bag training. The Battle rope and Bulgarian bag training group participated training for 5 days in a week, one session per day and for 8 week each session lasted 90 minutes. Group III acted as Control group. The control group did not participate in any special training programme apart from the regular physical activities as per the curriculum. In this study selected strength and physiological tests was carried out on each students. These included Grip strength assessed by Handgrip dynamometer and Vital capacity assessed by web spirometer. All the subjects of the three groups were tested on selected dependent variables at prior and immediately after the training programme. The analysis of covariance (ANCOVA) was used to analyze the significant difference, if any among the adjusted post-test means of experimental and control group on each variable separately. Whenever the obtained ‘f’ ratio for adjusted post-test means was to found to be significant, the scheffe’s test was applied, as a post hoc test to determine the paired mean differences. In all cases.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 as an appropriate.

The analysis of covariance on Grip Strength of the pre and post test scores of Battle rope Training Group, Bulgarian Bag Training Group and Control Group have been analyzed and presented in table I.

Table I: Analysis of Covariance of the Data on Grip Strength between Pre Test Post Tests and Adjusted Post Test of Battle Rope Training Bulgarian Bag Training and Control Groups

Test	Battle rope Training Group	Bulgarian Bag Training Group	Control Group	Source Of Variance	Sum Of Squares	Df	Mean Squares	Obtained ‘F’ Ratio
Pre test Mean	17.60	17.33	17.00	Between	2.71	2	1.35	0.85
S.D	1.40	1.23	1.13	within	66.93	42	1.59	
Post test Mean	22.53	21.53	17.53	Between	210.00	2	105.00	18.75*
S.D	3.13	2.41	1.06	within	235.20	42	5.60	
Adjusted Post test Mean	22.09	21.49	18.01	Between	140.79	2	70.39	36.94*
				within	78.13	41	1.90	

*Significant at 0.05 level of confidence.

(The table value required for significant at.05 level of confidence for 2 and 42 and 2 and 41 are 3.21 and 3.22 respectively).

Table I shows that the pretest means of Battle rope training group, Bulgarian bag training group and control group were 17.60, 17.33 and 17.00 respectively. The obtained ‘F’ ratio of 0.85 for pre test means was lesser than the table value of 3.21 for df 2 and 42 required for significant at 0.05 level of confidence. The post test means of Battle rope training group, Bulgarian bag training group and control group were 22.53, 21.53 and 17.53 respectively. The obtained ‘F’ ratio of 18.75 for post test means was greater than the table value of 3.21 for df 2 and 42 required for significant at 0.05 level of confidence. The adjusted post test means of Battle rope

training group, Bulgarian bag training group and control group were 22.09, 21.49 and 18.01 respectively. The obtained ‘F’ ratio of 36.94 for adjusted post test means was greater than the table value of 3.22 for df 2 and 41 required for significant at 0.05 level of confidence.

The result of the study indicated that there was a significant difference on Battle rope training group and Bulgarian bag training Group on Grip strength.

Since, three groups were compared, whenever the obtained ‘f’ ratio for adjusted post-test was found to be significant, the scheffe’s test to find out the paired mean difference and it was presented in table II.

Table 2: The Scheffe’s Test for the Differences between Paired Means on Grip Strength

Battle rope Training Group	Bulgarian Bag Training Group	Control Group	Mean Differences	Confidence Interval value
22.09	21.49		0.60	1.22
22.09		18.01	4.08	1.22
	21.49	18.01	3.48	1.22

*Significant at 0.05 level of confidence.

The table II shows that the mean difference values between Battle rope training group and control group and Bulgarian bag training group and control group 4.08 and 3.48 respectively on Grip strength which were greater than the required confidence interval value 1.22 for significance. And the mean difference value between Battle rope training group and Bulgarian bag training group 0.60 on Grip strength which was lesser than the required confidence interval value 1.22 for significance.

The result of the study showed that there was significant differences exist between Battle rope training group and control group and Bulgarian bag training group and control group on Grip strength. And no significant difference was found between Battle rope training group and Bulgarian bag training group on Grip strength.

Table 3: Analysis of Covariance of the Data on Vital Capacity between Pre Test Post Tests and Adjusted Post Test of Battle Rope Training Bulgarian Bag Training and Control Groups

Test	Battle rope Training Group	Bulgarian Bag Training Group	Control Group	Source Of Variance	Sum Of Squares	Df	Mean Squares	Obtained ‘F’ Ratio
Pretest Mean	1.58	1.53	1.35	Between	0.44	2	0.22	1.76
S.D	0.41	0.34	0.28	within	5.21	42	0.12	
Posttest Mean	2.57	2.42	1.35	Between	13.15	2	6.58	29.97*
S.D	0.55	0.53	0.28	within	9.21	42	0.22	
Adjusted Posttest Mean	2.49	2.38	1.47	Between	8.54	2	4.27	34.21*
				within	5.12	41	0.13	

*Significant at 0.05 level of confidence.

(The table value required for significant at.05 level of confidence for 2 and 42 and 2 and 41 are 3.21 and 3.22 respectively).

Table III shows that the pretest means of Battle rope training group, Bulgarian bag training group and control group were 1.58, 1.53 and 1.35 respectively. The obtained ‘F’ ratio of 1.76 for pretest means was lesser than the table value of 3.21 for df 2 and 42 required for significant at 0.05 level of confidence. The posttest means of Battle rope training group, Bulgarian bag training group and control group were 2.57, 2.42 and 1.35 respectively. The obtained ‘F’ ratio of 29.97 for posttest means was greater than the table value of 3.21 for df 2 and 42 required for significant at 0.05 level of confidence. The adjusted posttest means of Battle rope training group, Bulgarian bag training group and control group were 2.49, 2.38 and 1.47 respectively. The obtained ‘F’ ratio of 34.21 for adjusted posttest means was greater than the table value of 3.22 for df 2 and 41 required for significant at 0.05 level of confidence.

The result of the study indicated that there was a significant difference on Battle rope training group and Bulgarian bag training group on Vital capacity.

Since, three groups were compared, whenever the obtained ‘f’ ratio for adjusted post-test was found to be significant, the scheffe’s test to find out the paired mean difference and it

Grip Strength

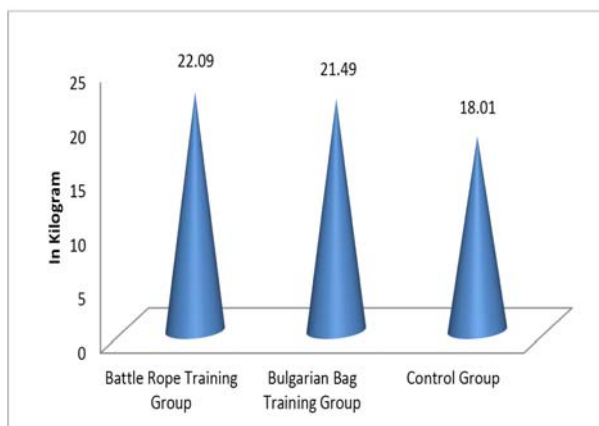


Fig 1: The Adjusted Mean Values of Battle Rope Training Bulgarian Bag Training and Control Groups on Grip Strength

The analysis of covariance on Vital capacity of the pre and post test scores of Battle rope training group, Bulgarian bag training group and Control group have been analyzed and presented in table III.

was presented in table IV.

Table 4: The Scheffe’s Test for the Differences between Paired Means on Vital Capacity

Battle rope Training Group	Bulgarian Bag Training Group	Control Group	Mean Differences	Confidence Interval value
2.49	2.38		0.11	0.30
2.49		1.47	1.02	0.30
	2.38	1.47	0.91	0.30

*Significant at 0.05 level of confidence.

The table IV shows that the mean difference values between Battle rope training group and control group and Bulgarian bag training group and control group 1.02 and 0.91 respectively on Vital capacity which were greater than the required confidence interval value 0.30 for significance. And the mean difference value between Battle rope training group and Bulgarian bag training group 0.11 on Vital capacity which was lesser than the required confidence interval value 0.30 for significance.

The result of the study showed that there was significant differences exist between Battle rope training group and control group and Bulgarian bag training group and control

group on Vital capacity. And no significant difference was found between Battle rope training group and Bulgarian bag training group on Vital capacity.

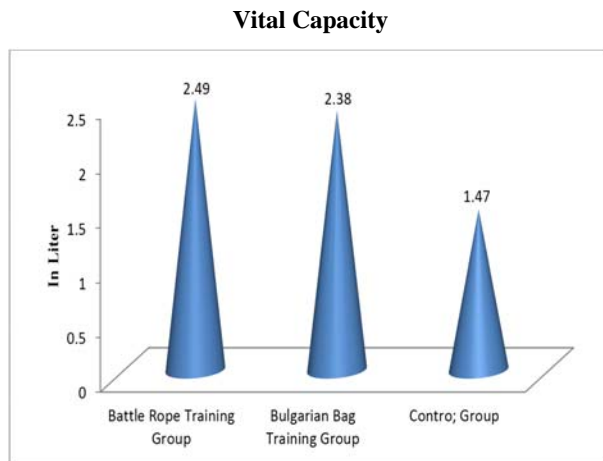


Fig 2: The Adjusted Mean Values of Battle Rope Training Bulgarian Bag Training and Control Groups on Vital Capacity

2. Conclusions

1. There was a significant difference among Battle rope training group, Bulgarian bag training group and Control group on Grip strength.
2. There was a significant difference among Battle rope training group, Bulgarian bag training group and Control group on Vital capacity.
3. There was a significant improvement on selected criterion variable due to Battle rope training group and Bulgarian bag training group. However, the improvement on Grip strength was better in Battle rope training group when compared to Bulgarian bag training group.
4. There was a significant improvement on selected criterion variable due to Battle rope training group and Bulgarian bag training group. However, the improvement on Vital capacity was better in Battle rope training group when compared to Bulgarian bag training group.

3. Reference

1. Bobu Antony, Uma Maheswri M, Palanisamy A. Effect of Battle rope training on selected physical and physiological variables among college level Athletes, Indian Journal of Applied Research. 2015; 5(5):1-4.
2. Vairavasundaram C, Palanisamy A. Effect of Bulgarian bag training on selected physical variables among handball players, Indian Journal of Applied Research. 2015; 5(3):1-3.
3. John Brookfield. Battling Ropes Training System. West Warwick, RI, 02893, 2015, 888-556-7464.
4. John Brookfield. Introduction to the Battling Ropes System. Pinehurst, NC 28374, 2014; 910:295-4049.
5. Kyle Brown. The Bulgarian Bag: Extreme Training for the Next Fitness Generation. NSCA's Performance Training Journal. 2009; 8(3):11-12.
6. Bulgarian Training Bag – History. Suples, ltd. Inc., Retrieved, 2013.