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Effects of sport loading and plyometric training on strength among Football Players

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Abstract

The purpose of the study was to find out the effects of sport loading and plyometric training on strength among football players. Forty five male (n = 48) amateur football players were randomly selected as subjects and their age ranged from 18 to 22 years. The selected subjects were randomly assigned into three equal groups of fifteen subjects each (n= 15), namely experimental group I was underwentsport loading (SL), group II underwent plyometric training (PG) was designed by the investigator and was administered for a period of 8 weeks 3 days a week, a session each day, and group III control was not exposed to any specific training (CG). Strength was selected as variable for this study. Analysis of covariance (ANCOVA) was used to analysethe data. Scheffe's test was used as a post hoc test to determine which of the paired mean difference significantly. The result of the study revealed that Sport loading (SL), and plyometric training (PG) produced significant improvement on strength (p□□0.05) as compared to CG.

Keywords: *Sport loading, Plyometric training, strength*

1. Introduction

Sport loading has become a popular training method with many sports teams and athlete. This can involve an athlete towing a weight sled, tire pulls, speed parachute, or some other device over a set distance. It has been said that such as technique will increase muscular force output, especially at the hip, knee, and ankle, leading to potential in stride length over time. The popularity of sport loading programme device is reflected in its inclusion in a number of recent publications. This form of training is often used with a view to enhancing acceleration performance, even though there is little the way of scientific evidence to support such a practice.

Sport loading can be defined as the systematic addition of weight to the others player's body in any form (uniform, vest pants (or) shirts) or to the implements used in sports (sticks, pats, balls and so on.) Speed and acceleration are essential components of team sports. In addition, and maximum-effort sprinters are often too short to allow for the attainment of peak speed for athletes in these sports. As a result, the acceleration period of a sprint effort becomes an important focus for sport loading programme for such athletes. Sport loading is a technique designed to improve explosive concentric movements such as sprinting speed. A relatively light resistance that does not drastically alter sprinting from produces the best result. Increases acceleration, the amount of force the body has to be mange increase, thereby providing increased loading on the body. Jumping higher and faster in competition or practice produces a higher functional loading with specie positive benefits. However, define sport loading as the systematic adding of weight to your body in any form (uniforms, vest, ball, and so on) or' to the implements use in sport (bats, ball, and so on). This method is not new. It has been used by many athletes through the year, by accent in many case and by design in others. Interestingly, coaches of sports that involve carrying additional weight in the form of protective gear haven't, placed a great emphasis on adding uniform weight to the body during training or testing and evaluating placers. The majority of the loading has been

applied by using partners or field equipment such as sleds. It also involves the ability of the nervous system to process and produce rapid contraction and relaxation of the muscle fiber, fast explosive movements of the entire body which occur in starting and acceleration phases of sprinting or of adjusting a body part to start a new movement or rapidly change direction and demonstrate an athlete quickness (Dintiman, 1997).

Strength is the ability to act against resistance. It is, in fact, a product of voluntary muscle contractions caused by the neuro-muscular system (Singh, 1991). Strength is one of the most important components of physical fitness, which affects performance in almost all games and sports in some form or the other. The primary objective of strength in training is not to learn to lift as much weight as possible but to increase strength for application to the relevant sport. Leg strength is the capacity of the lower limb to exert muscular force (Baugartner& Jackson, 1987).Leg strength is very essential for sports persons, especially athletes. The strength of a muscle related to its sectional area or girth. In this study the leg dynamometer is the instrument used to measure the leg strength. The capacity of lower limb to extent muscular force, the leg strength is measured by the limits of lifting resistance in lowering to and arising from sitting position (Johnson & Nelson, 1982).

2. Methodology

The purpose of this study was to determine the effects of sport loading and plyometric training on strength among players. Forty five amateur male (n=45) football players studying different department of Kerala university, Kerala were selected as subjects and the age of students were between 18 and 22 years. The selected subjects were randomly divided into three equal groups of fifteen subjects each (n=15). The groups were Sport loading group (SL), plyometric training group (PG) and one control (CG). During the training period, the experimental groups underwent their respective training programme for eight weeks 3 days per week and a session on each day. Control group (CG) was not exposed any specific trainingapart from their regular curriculum. Moderate intensity (60-70%) of resistance was used in this experimentation. Leg strength was selected as dependent variable for this study. It was measured by using leg lift with dynamometer. These are the exercise used as resistance 1.Weight body suit,2.Weight vests,3.Parachutes, 4.Harnesses,5.Stadium stairs/step running,6.Weighted Sleds.7.Hill Running, 8.Sand runs. These plyometric exercises are used to perform this study for strengthening the lower body 1. Drop jump; 2. Tuck jump; 3. Split jump; 4. Bounding; 5. Single leg hop; 6. Hurdling; 7. Medicine- ball exercises; 8. Stepping. 9. Box jump.

2.1 Data Analysis

Mean and standard deviation were calculated for leg strength for each training group. And the data were analyzed by using analysis of covariance (ANCOVA). If the 'F' value was found to be significant for adjusted post-test mean, Scheffe's test was applied as post hoc test to determine the significant difference between the paired mean. Statistical significance was set to priority at 0.05 levels.

3. Results

Table – I

ANALYSIS OF COVARIANCE ON LEG STRENGTH OF EXPERIMENTAL GROUPS AND CONTROL GROUP

Test	SL	PG	CG	SOV	SS	Df	MS	F
Pre-test								
Mean	80.13	80.67	78.53	B G	36.98	2	18.49	0.98
S.D (±)	4.37	4.45	4.17	W G	788.8	42	18.78	
Post-test								
Mean	91.73	87.73	79.53	B.G	1160.4	2	580.2	
S.D (±)	5.44	4.46	4.55	W G	983.6	42	23.42	24.78*
Adjusted Post-test								

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Mean	91.75	87.77	79.49	B G	1135.89	2	567.95	23.7*
				W G	982.53	41	23.96	

*Significant, F = (df 2, 42) (0.05) = 3.22; (P ≤ 0.05), F = (df 2, 41) (0.05) = 3.225; (P ≤ 0.05)

Table I shows that the pre test mean of experimental and control groups are 80.13, 80.67 and 78.53 respectively. The obtained F ratio of 0.98 for pre test mean is lower than the table value 3.22 for df 2 and 42 required for significance at 0.05 level. The post tests mean of experimental and control groups are 91.73, 87.73 and 79.53 respectively. The obtained F ratio of 24.78 for post test mean is higher than the table value 3.22 for df 2 and 42 required for significance at 0.05 level. The adjusted post test mean of experimental and control groups are 91.75, 87.77 and 79.49 respectively. The obtained F ratio of 23.7 for adjusted post test mean is higher than the required table value 3.225 for df 1 and 41 required for significant at 0.05 level. The result of the study indicated that there was a significant difference between the adjusted post tests mean of Sport loading group, plyometric training group and control group on leg strength at 0.05 levels. Since, three groups were compared, whenever they obtained 'F' ratio for adjusted post test was found to be significant, the Scheffe's test was used to found out the paired mean difference and it was presented in table II.

Table- II

Scheffe's post hoc test for the difference between paired mean on leg strength

SL	PG	CG	MD	CI
91.75	87.77		3.98	
91.75		79.49	12.26*	4.54
	87.77	79.49	8.28*	

*Significance at 0.05 level of confidence (p ≤ 0.05).

Table II showed that the adjusted post test mean difference on leg strength between Sport loading group and control group and plyometric training group and control group are 12.26, and 8.28 respectively. These values are higher than the required confidence interval value of 4.54, which shows significant difference at 0.05 level of confidence. The results of the study showed that there was a significant difference between Sport loading group and control group and plyometric training group and control group. The pre, post and adjusted post test mean values of experimental groups and control group on leg strength is graphically represented in the figure 1.

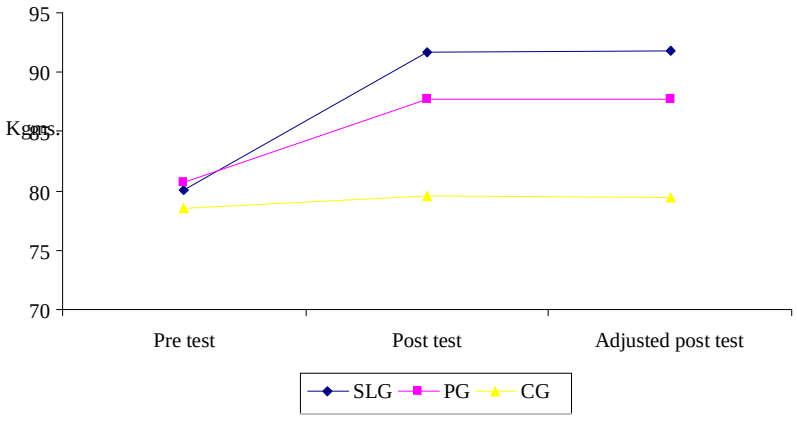

Figure 1: The pre, post and adjusted post test mean values of experimental groups and control group on leg strength

4. Discussion

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The Sport loading group demonstrated greater increases in strength compared with the control group. Plyometric training is also help to improve leg strength at significant level. Many research studies revealed that the use of different training loads elicits different training adaptations and further it indicate that it also includes the volume specific adaptations in strength variable (Christou, 2006). Many research studies suggest that Sport loading group may be valuable for determining the physical variables such as leg strength (Lesnegard *et al*., 2010). Teixeira *et al*. (2001) pointed out that resistance training three times per week is an effective as five times per week. The development of leg strength as a result is supported by the findings of George & Thomas (2011). The various training components (E.g. sets, repetitions, rest, intervals) could be manipulated the training loads used from the most important factor that determine the training stimuli and the consequent training adaptations(Myer *et al*., 2006). From the results of the present study and literature, it is concluded that the dependent variables such as leg strength was significantly improved due to the moderate intensity sport loading training plyometric training.

5. Conclusion

The result of this study suggests that's sport loading modality targets the leg strength. Any practical application requires careful implementation and individual experimentation. In summary, the leg strength can be improved during the age between 18 and 22 years of male students and favor the prescription of moderate intensity sport loading training and plyometric training during the initial adaptation period. There was no significant difference between sport loading group and plyometric training group. From this study we can concluded that sport loading is the top to improve leg strength followed by plyometric training. Finally, the studies presented in this review demonstrate that there was a significant improvement on leg strength due to moderate intensity sport loading training and plyometric training as compared to control group.

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