

Original Article

Effects of weight training on power performance

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Abstract

Introduction: Harris et al. declared that some researchers claim the use of 80% of 1RM is recommended to improve power characteristics, while others suggest 50-60% of 1RM and below. Kawamori and Haff agreed with Harris et al., stating that there is inconsistency in the optimal load to produce the highest power. They claimed that some studies that used untrained subjects, single joint exercises, and upper-body exercises reported 30-45% of 1RM, while others using trained subjects, multi-joint exercises, and lower-body exercises reported 30-70% of 1RM.

Method: The purpose of the study was to find out the effect of weight training in the developing the power performance among 20 students between 16 to 18 years of age enrolled for physical education course for the academic year 2010, were selected as subjects. Pre and post test was conducted for the group on 1RM of squats, bench press and dead lift. 45 minutes weight training program, twice a week, for 12 weeks was given to the subjects. The statistical tools used were mean, SD, and 't' -test.

Results & Discussion: The analysis of the data reveals that the subjects with the training have shown improvement in the performance of squats from pre to post test with the mean and S.D being (76.00, 26.59) and (93.75, 27.19) respectively. The improvement is quite encouraging and highly significant ($p < 0.0001$).

With regard to bench press exercise of the subjects the mean and S.D in the pre and post test were (53.00, 23.14) and (70.25, 23.37). The data clearly speaks of an improved performance from pre to post scores of the students which is highly significant at ($p < 0.0001$). The mean and S.D in the pre and post test were (104.00, 28.31) and (135.00, 24.97) respectively with respect to dead lift exercise. There is an increase in the power of the students which is encouraging and highly significant with ($p < 0.0001$).

Conclusions: It is concluded from this study, that there was a marked improvement in the performance of the students in power exercises among all the events from pre to post test, which is quite significant.

Key words: Weight training, Power, squats, Bench press, Dead lifts.

Introduction

In recent days weight training has attracted the youth globally. The youngsters would like to develop their muscles to look like their role models namely Arnold, Rambo, and Salman Khan. Now a day in all the movies heroes' exhibit sound physique with very good arms, chest, shoulders, and abdominals (6 packs) and the young generation would like to copy their heroes. They are aware that such physique can only be developed through the resistance training. Weight training not only helps to look better, but it also plays an important role in maintaining quality of life. Weight training is also beneficial to all the top athletes since it improves overall physical fitness. This apart there are lot of benefits from weight training, as it helps to strengthen the bones, decrease the resting blood pressure, improves muscular strength, makes the heart more efficient, has a beneficial effect on almost all the major and minor 650+ muscles, and makes one feel better and strong. In recent years the discipline of power lifting has made a mark as a leading sport apart from weight lifting and body building. This sport has become so popular with the students that almost big strata of these students indulge in practicing it. In the present study the events which constitute this game are selected. There are 3 events in the game of power lifting, which are as follows, squats, bench press, and dead lift. In the power lifting championship each athlete is offered three attempts in each event to perform and the best lift of three attempts is taken into consideration for judging his performance. Harris et al. declared that some researchers claim the use of 80% of 1RM is recommended to improve power characteristics, while others suggest 50-60% of 1RM and below. Kawamori and Haff agreed with Harris et al., stating that there is inconsistency in the optimal load to produce the highest power. They claimed that some studies that used untrained subjects, single joint exercises, and upper-body exercises reported 30-45% of 1RM, while others using trained subjects, multi-joint exercises, and lower-body exercises reported 30-70% of 1RM. The main purpose of the study was to evaluate the power of the students of KFUPM and determine the effect of weight training on the three different power tests.

Method: 20 male students in the age group of 16 to 18 years enrolled in the weight lifting for the 2010 academic year were selected as subjects for the study. The sample was randomly selected from a group of 50 students who were in the above training. The tests which were selected for the study were squats, bench press (B.P), and dead lift (D.L). The procedure of all these exercises was explained and demonstrated before the pre and post test administration. A schedule of 45 minutes weight training program was employed on the students twice a week for a Period of 12 weeks. The first 4 weeks the load was 35-45 % of 1RM, 5th to 8th week the load was 55-65 % of 1RM, In the last phase of training from 9th -12th week 75 -85 % of 1 RM was employed on the subjects. A post test was conducted at the end of 12th week.

Results: In the jet age the science of weight training has made tremendous progress to device ways and means to gain strength. Strength cannot be achieved or developed with out the resistance training. Experts have been experimenting with various training programmes to enhance the performance with the aid of weight training. Training schedule with the best equipment has had an impact on sports persons to improve in their performance. The results of the study are as under, the mean, S.D, and 't'- test of the subjects are presented in the tables from 1 to 3.

Table-1

Paired t-test and CI: Squat pre, Squat Post

| Paired t for Squat Pre – Squat Post | | | | |
|-------------------------------------|----|--------|---------|---------|
| | N | Mean | St Dev. | SE Mean |
| Squat Pre | 20 | 76.00 | 26.59 | 5.94 |
| Squat Post | 20 | 93.75 | 27.19 | 6.08 |
| Difference | 20 | -17.75 | 12.82 | 2.87 |

95% CI for mean difference: (-23.75, -11.75)

t-test of mean difference = 0 (vs not = 0): t-Value = -6.19 P-Value = 0.00

Table-1, above indicates the results with regard to squats. The students of KFUPM with the training have shown improvement in the performance of squats from pre to post with the mean and S.D being (76.00, 26.59) and (93.75, 27.19) respectively. The improvement is quite encouraging and highly significant ($p < 0.0001$).

Table-2

Paired t-test and CI: Parallel Bench press- Pre, Parallel Bench press- Post

| Paired t for Par B Pre – Par B Post | | | | |
|-------------------------------------|----|--------|---------|---------|
| | N | Mean | St Dev. | SE Mean |
| Par Pre | 20 | 53.00 | 23.14 | 5.17 |
| Par Post | 20 | 70.25 | 23.37 | 5.22 |
| Difference | 20 | -17.25 | 16.90 | 3.78 |

95% CI for mean difference: (-25.16, -9.34)

t-test of mean difference = 0 (vs not = 0): t-Value = -4.57 P-Value = 0.00

Table-2, above indicates the mean and S.D of the bench press which is one of the events of power lifting. The mean and S.D in the pre and post test are (53.00, 23.14) and (70.25, 23.37) respectively. The data clearly speaks of an improved performance from pre to post scores of the students which is highly significant at ($p < 0.0001$).

Table-3

Paired t-test and CI: Dead lift- Pre, Dead lift-Post

| Paired t for Dead lift Pre – Dead lift Post | | | | |
|---|----|--------|---------|---------|
| | N | Mean | St Dev. | SE Mean |
| Deadlift Pre | 20 | 104.00 | 28.31 | 6.33 |
| Par Post | 20 | 135.00 | 24.97 | 5.58 |
| Difference | 20 | -31.00 | 6.41 | 1.43 |

95% CI for mean difference: (-34.00, -28.00)

t-test of mean difference = 0 (vs not = 0): t-Value = -21.64 P-Value = 0.00

Table-3, above indicates how the pre and post test with regard to D.L differ in mean and S.D which are as follows (104.00, 28.31) and (135.00, 24.97) respectively. There is an increase in the power of the students which is encouraging and highly significant with ($p < 0.0001$).

Discussion: Squat exercise is said to be the king of exercises, which needs lot of skill and power to perform. Squat is one of the basic exercise which helps to take care of the strength of the lower extremity. It plays an important role in the activities of the life apart from helping to have locomotion. A person with good lower strength can carry his body with ease and his performance will be enhanced. Squats help in the improvement and total development of thigh muscles, which ultimately results in the improved power performance of the students. The squat exercise mainly works on the quadriceps, gluteal muscles, adductor group, erector spinae, abdominal muscles, and the hamstrings. The participants had shown improved performance from pre to post test regard to squat exercise. The upper part of the body of a person indicates how the personality can make a difference in appearance. It is seen that almost a high percentage of people develop the chest muscles to give the look of huge and strong. The importance of having more strength in chest is quite understandable as the vital organs are located in this part. The reasons now are very clear why athletes tend to develop the upper body. Bench press exercise develops pectoralis major muscle, pectoralis minor, anterior deltoid, serratus anterior and coracobrachialis. The Bench press exercise is a test for upper body and one of the events in power lifting. The subjects had showed increased performance in bench exercise from pre to post test. Lastly the participants showed greater performance in the dead lift exercise from pre to post test. Dead lift (D.L) is one of the exercise which effects on the quadriceps and adductor muscles intensely. In upper extremity, the trapezius muscles are involved during the D.L exercise along with the chest, shoulders, arms and abdominals muscles. The D.L exercise is a test for both upper and lower limbs and is one of the three events in power lifting. In the human body the lower back is prone for injury as it has no support in the front. The D.L in power lifting is planned in such a way to restrict injury to the lower back with the position of the pelvic, which is not tilted as compared to the D.L, in straight knee position which can cause injury in the lower back. Hence the safety of the lifter is taken care in this event. Mostly the trainees like to practice bench and dead lift, they neglect squats because it needs lot of power, hard work, and dedication.

CONCLUSION: It is concluded from this study, that there was a marked improvement in the performance of the students in power exercises among all the events from pre to post test, which is quite significant. The students have shown a highly marked improvement in performance of dead lift, which shows the interest among the students for this event, which is very encouraging and significant. Further more with regard to the comparison among the three events it is concluded that the performance of the students in dead lift was the best followed by bench press. Squats took the last place among these events where the performance of the students was the least.

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