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Effectiveness of six weeks training on static strength of archery players

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Abstract

The main purpose of the study was to compare the effectiveness of six weeks training on static strength of the archers players. To study the effectiveness of six week training on static strength of arm and back 30 male archery players were selected randomly from Shree Hanuman Vyayam Prasarak Mandal's Coaching Center (Amravati) on the basis of age ranging from 17 to 24 years. Researcher divided the subjects in to two homogeneous groups having 15 subjects in each group. The subjects were equated and distributed into two homogeneous groups viz. 1. Experimental group, 2. Control group. The experimental group was given six weeks training schedule. There was no special exercise training for the control group. For testing the significance effect of some selected exercises on arm and back strength of archers (t) test was employed to determine the difference between in the performance between pre-test and post-test means of each group. To test the hypothesis, the level of significance is set at .05 level of confidence which is considered adequate for the purpose of this study.

In the beginning of the present study, there was no significant effect of the selected exercises on arm strength and back strength of archers. But later, the result of the study shows that there is significant improvement in the arm strength and back strength due to the selected training programme.

Keywords: Shree Hanuman Vyayam Prasarak Mandal's Coaching Center, static strength, homogeneous groups, Experimental group, Control group, archery players, arm and back strength.

Introduction

Archery coaches teach that the most important movement in archery is "back tension." The rhomboids (major and minor) are two deep muscles of the back that are used primarily to create back tension. Their movement is to retract or pull the shoulder blades toward the spine. The rhomboids are aided by another deep muscle called the levator scapulae, which pulls the shoulder blade inward and also upward toward the base of the neck. The trapezius muscle is a broad superficial muscle group consisting of three parts: the upper, middle, and lower sections. The muscle fibers of these sections act as ropes that pull the shoulder blade upward, inward, or downward depending on the angle of pull on the fibers. The rhomboids, levator scapulae, and trapezius are the major muscle groups used for back tension and, when used correctly, are responsible for holding the bow back at full draw. The latissimus dorsi is the largest muscle of the back. It extends from the pelvis to the mid-back and attaches on the arm. The main function is to pull the arm to the side, extend the arm backward, and also rotate the arm inward. During the drawing motion, the "lats" aid the posterior deltoid in extending the drawing arm backward and also rotating the arm inward. On the side of the bow arm, the lats help the middle deltoid stabilize the bow arm into the shoulder joint for increased stability. The "lat pull down" is a popular exercise to strengthen the latissimus dorsi. The primary archery muscles of the shoulders and upper back are the rhomboids, levator scapulae, trapezius, deltoids, latissimus dorsi, and the rotator cuff muscle group, which includes the supraspinatus, infraspinatus, and teres minor. So the researcher would like to see the effect of some selected strength training on strength of arm and back, which is major influences of archers players to give the higher performance.

Statement of Problem: The researcher would like to conduct the research to see the effect of six weeks training on static strength of the archers players. The exercises were selected to study their effects on the arm strength and back strength of archers.

Method of study

The research scholar took male archers for this study. All the subjects were selected from Shree Hanuman Vyayam Prasarak Mandal's Archery Coaching Center (Amravati). 30 male archery, players were selected randomly from Shree Hanuman Vyayam Prasarak Mandal's Coaching Center (Amravati) on the basis of age ranging from 17 to 24 years.

Selection of Test and Criterion Measures: The criterion measures chosen for testing the hypothesis in this study were numerical scores obtain from the strength tests.

- a. To measure arm strength, pull - up test was administered and score was recorded in number.
- b. To measure back strength, Roger back strength test was administered and score was recorded in number.

Tools and Equipments: Pull up bar, back and leg dynamometer etc.

Administration of test

A) Pull-Up Test: - To measure the arm strength, pull-up test were administered.

Test Administration: - The bar was adjusted at such a height so that the feet of the tallest subject do not touch the ground while hanging on the chinning bar. The subject was asked to hang from the bar by his hands with forward grip and to chin up by pulling himself up until his chin was above the bar. Then he was asked to lower the body until his arm was straight and he was asked not to kick, jerk or use a kip motion. When he did not straighten his arms completely while lowering the body or if he kicked, jerked or kiped (keeping one's chin on the bar) in performing the movement, then half counts were recorded. Only four half count were permitted.

Scoring: - The number of complete pull-ups plus one half of the half counts (if any) constitute the scoring.

B) Back Strength Test: - To measure back strength, back and leg dynamometer instruments were used.

Test Administration:- The subjects were asked to be in the standing position with trunk lightly flexed (10-15°) forward at the hip, holding the dynamometer bar, one hand from above and the other hand from below the bar. The bar was adjusted at a level just below finger tips when the subject stood erect with hands on the front of thigh. The hands were spread apart equal to the width of the shoulders. The body weight was balanced on the feet which was placed about six inches apart. The knees and the back were kept straight throughout the lift and the lift was steady upward without jerking. The subject was asked not to lean backward on the heels. Two or three trials were allowed for the test.

Scoring: - The highest of two or three readings was recorded in pounds or kilograms as score.

Experimental Design

Researcher divided the subjects in to two homogeneous groups having 15 subjects in each group. The subjects were equated and distributed into two homogeneous groups viz-

- i) Experimental group
- ii) Control group

The experimental group was given six weeks training schedule. There was no special exercise training for the control

group. After Training Administration of test, the tests were conducted on both the group and were recorded as post-test.

Analysis of data

The data of pre-test and post-test were arranged and tabulated for further treatment. For the present investigation, the researcher divided the players into two equal groups on the basis of the mean performance of pretest score. For testing the significance effect of some selected exercises on arm and back strength of archers (t) test was employed to determine the difference between in the performance between pre-test and post-test means of each group. The subjects were equated and distributed into two homogeneous groups viz-

- i) Experimental group
- ii) Control group

To test the hypothesis, the level of significance is set at .05 level of confidence which is considered adequate for the purpose of this study.

Findings

Findings pertaining to the study of significance effect of some selected exercises on arm and back strength of archers are presented below:

Table 1: Pre-test Mean of Control Group and Experimental Group in Arm Strength

Group	Mean	S.D.	M.D.	S.E.	t-ratio
Control group	10.26667	1.624221	1.733	0.887	1.955*
Experimental group	12.00000	2.13809			

*Not significant at 0.05 level of confidence

Calculated value of $t = 1.955$, tabulated $t_{0.05} (df 14) = 2.145$
 From the observation of Table No.1 it is revealed that there is no significant difference between the pre-test of control group and experimental group as the calculated value of $t=1.955$ is less than the tabulated $t_{0.05} (df 14) = 2.145$. Calculated value of $t=1.955 < \text{tabulated } t_{0.05}=2.145$

Table 2: Pre-test Mean of Control Group and Experimental Group in Back Strength

Group	Mean	S.D.	M.D.	S.E.	t-ratio
Control group	111.5667	16.73413	0.7	5.54	0.12*
Experimental group	110.8667	13.43033			

* Not significant at 0.05 level of confidence

Calculated value of $t = 0.12$, tabulated $t_{0.05} = 2.145$
 From the observation of Table No.2 it is revealed that there is no significant difference between the pre-test of control group and experimental group as the calculated value of $t=0.12$ is less than the tabulated $t_{0.05}=2.145$. Calculated value of $t=0.12 < \text{tabulated } t_{0.05}=2.145$

Table 3: Significant of Mean Difference between Pre-Test and Post-Test of Control Group (Arm Strength)

Group	Mean	S.D.	M.D.	S.E.	t-ratio
Pretest	10.26667	1.624221	.322	.53	.607*
Posttest	10.46666667	1.302013093			

*not significant at 0.05 level of confidence

Calculated value of $t = 0.607$, tabulated $t_{0.05} = 2.145$
 From the observation of Table No.3 it is revealed that there is no significant difference between the pre-test and post-test of control group as the calculated value of $t=0.607$ is less than the tabulated $t_{0.05}=2.145$. Calculated value of $t=0.607$ is less than the tabulated $t_{0.05}=2.145$

Table 4: Significant of Mean Difference between Pre-Test and Post-Test of Control Group (Back strength)

Group	Mean	S.D.	M.D.	S.E.	t-ratio
Pretest	111.5667	16.73413	0.8	18.25	0.043*
Posttest	110.7667	16.82989			

*not significant at 0.05 level of confidence

Calculated value of $t=0.043$, tabulated $t_{0.05}=2.145$
 From the observation of Table No.4 it is revealed that there is no significant difference between the pre-test and post-test of control group as the calculated value of $t=0.043$ is less than the tabulated $t_{0.05}=2.145$. Calculated value of $t=0.043 < \text{tabulated } t_{0.05}=2.145$

Table 5: Significant of Mean Difference between Pre-Test and Post-Test of Experimental Group (arm strength)

Group	Mean	S.D.	M.D.	S.E.	t-ratio
Pretest	12	2.13809	1	0.988	1.012*
Posttest	13	2.171240593			

*not significant at 0.05 level of confidence

Calculated value of $t=1.012$, tabulated $t_{0.05}=2.145$
 From the observation of Table No.5 it is revealed that there is no significant difference between the pre-test and post-test of experimental group as the calculated value of $t=1.012$ is less than the tabulated $t_{0.05}=2.145$. Calculated value of $t=1.012 < \text{tabulated } t_{0.05}=2.145$

Table 6: Significant of Mean Difference between Pre-Test and Post-Test of Experimental Group (Back Strength)

Group	Mean	S.D.	M.D.	S.E.	t-ratio
Pretest	110.8667	13.43033	24.3	15.18	1.6*
Posttest	135.1666667	17.47208658			

*not significant at 0.05 level of confidence

Calculated value of $t=1.012$, tabulated $t_{0.05}=2.145$
 From the observation of Table No.6 it is revealed that there is no significant difference between the pre-test and post-test of experimental group as the calculated value of $t=1.012$ is less than the tabulated $t_{0.05}=2.145$. Calculated value of $t=1.012 < \text{tabulated } t_{0.05}=2.145$

Table 7: Post-test Mean of Control Group and Experimental Group in Arm Strength

Group	Mean	S.D.	M.D.	S.E.	t-ratio
Control	10.46666667	1.302013093	2.533	0.75	3.377*
Experimental	13	2.171240593			

* Significant at 0.05 level of confidence

Calculated value of $t=3.377$, tabulated $t_{0.05}=2.145$
 From the observation of Table No.7 it is revealed that there is significant difference between the post-test of control group and experimental group as the calculated value of $t=3.377$ is greater than the tabulated $t_{0.05}=2.145$. Calculated value of $t=3.377 > \text{tabulated } t_{0.05}=2.145$

Table 8: Post-test Mean of Control Group and Experimental Group in Back Strength

Group	Mean	S.D.	M.D.	S.E.	t-ratio
Control	110.8667	13.43033	24.299	5.69	4.27*
Experimental	135.1666667	17.47208658			

* Significant at 0.05 level of confidence

Calculated value of $t=4.27$, tabulated $t_{0.05}=2.145$
 From the observation of Table No.8 it is revealed that there is significant difference between the post-test of control group and experimental group as the calculated value of $t=4.27$ are greater than the tabulated $t_{0.05}=2.145$. Calculated value of $t=4.27 > \text{tabulated } t_{0.05}=2.145$

Discussion on findings

It is evident from table 1 and table 2 that there is no significant difference between the pre-test of control group and experimental group in arm strength test and back strength test. It is clearly visible from the above table 3 and 4 that there is no significant difference between the pre-test and post-test of control group and experimental group in the arm strength test and back strength test. The findings of table-5 and 6 indicate that there is no significant difference between the pre-test and post-test of the experimental group in the arm strength test and back strength test. Lastly, the finding of table -7 and 8 shows that there is a significant difference of posttest between control group and experimental group. It has been observed from the result of the findings of this study that the experimental group has shown significant improvement in the arm strength and back strength as compared to the control group. This significant improvement in the arm and back strength of the selected group may be accredited to the nature of training programme which consisted of different exercises for arm strength and back strength.

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