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Effect Of Medicine Ball Exercises On Hand Grip Strength And Flexibility Of College Male Students

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Abstract
The purpose of the study was to determine the effect of medicine ball exercises on hand grip strength and flexibility of college male students. For the study research scholar selected fourty college male students at the age of 18-20 years and divided into two groups experimental group (N=20) and control group (N=20). Hand grip strength was measured with hand grip Dynamometer and flexibility was measured with 'Sit and Reach Test'. Experimental group was participated in the medicine ball exercises. Data was analysed with the help of descriptive analysis and 't' test. These findings suggest that medicine ball exercises are effective in enhancing hand strength and flexibility in college students. Experimental group was significantly improving the hand strength and flexibility because of participation in medicine ball exercises.
Keywords: Medicine ball training, hand strength, flexibility, hand grip Dynamometer, Sit and Reach Test, college students.

Introduction

Hand strength and flexibility are essential for athletic performance, everyday tasks, and preventing injuries. Medicine ball exercises are commonly used to improve muscle power, coordination, and flexibility. Both hand strength and flexibility are key factors in sports performance, functional fitness, and reducing the risk of injury. Activities like Basketball, Baseball, Tennis, Tug of War and Weightlifting rely on a strong grip and flexible wrist for peak performance. Weak hand muscles can negatively affect performance and increase the likelihood of injury.

Medicine ball exercises are commonly utilized for strength and coordination training, particularly targeting the upper body, wrist and fingers. These exercises improve muscle endurance, power, and joint mobility, making them highly effective for building hand strength and flexibility.

Many college students participate in academic tasks (such as writing, typing, and carrying books) as well as sports, both of which demand strong grip and wrist mobility. Consistent medicine ball training can boost hand function, enhance athletic performance, and lower the risk of injury.

Research highlights that handgrip strength is directly linked to sports performance and overall muscular endurance (Anderson et al., 2021). Strong hands contribute to better control, power, and injury prevention in athletes (Brown & Carter, 2019). Studies indicate that medicine ball exercises improve grip strength, upper-body power, and coordination (Williams et al., 2020). Exercises such as wrist rolls, throws, and slams engauge the fore arm muscles, enhancing both strength and flexibility. Compared to traditional grip exercises (hand grippers, resistance bands, or wrist curls) medicine ball training provides a dynamic, functional, and engauging approach to strengthening the hands and wrists (Smith et al.,2022).

Statement of the problem

This study was undertaken to know the "effect of medicine ball exercises on hand grip strength and flexibility of college male students."

Purpose of the study

The purpose of the present study was to evaluate the effect of medicine ball exercises on hand grip strength and flexibility of college male students.

Objectives of the Study

1. To examine the impact of medicine ball exercises on hand grip strength.
2. To assess the improvement in wrist flexibility after an 8-week training program.

Hypothesis

It was hypothesized that medicine ball exercises significantly improve hand grip strength and flexibility of male college students.

Delimitations

The present study was delimited in the following aspects:

1. The study was delimited to 40 male college students.
2. The study was delimited to male students only.
3. The subjects for the present study were randomly selected.
4. The subjects were divided into two groups: experimental group (N = 20) and control group (N = 20).

Limitations

The present study was limited to the following aspects:

1. Dietary habits of experimental group and control group were not under control of the researcher.
2. Daily activities of the participants were not control.
3. No restrictions were imposed upon the other physical activities of experimental group and control group subjects.

Methodology

For the present study forty college male students were randomly selected at the age group of 18-20 years as subjects of the study. The randomly selected subjects were divided into two groups' i.e.

experimental group (N = 20) and control group (N = 20). The independent variables in the present investigation were the medicine ball exercises and the dependent variable in the present investigation was hand grip strength and flexibility.

Hand strength was measured with hand grip Dynamometer and flexibility was measured with 'Sit and Reach Test'. The subjects were given a medicine ball exercises of one hour duration for five days per week for three months. The first ten minutes were given to warm up of the subjects and forty minutes for treatments and the last ten minutes for cool-down. The subjects were administered with medicine ball exercises i.e. Medicine Ball Wrist Rolls, Medicine Ball Slams, Overhead Medicine Ball Throws, Medicine Ball Finger Squeezes and Medicine Ball Rotational Twists.

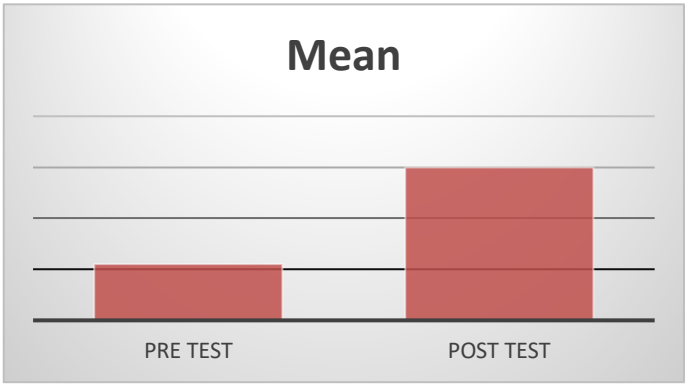
Analysis of data and Interpretation of the Result

Analysis of data and interpretation of the result was done by using the mean and standard deviation. Comparative analysis was done by using 't' ratio. The level of significance was kept at 0.05 levels. It was hypothesized that there will be significant changes in the hand grip strength and flexibility of male college students if they do regular medicine ball exercises.

Table 1. Showing the pre-test and post-test score of Hand Grip Strength of the ExperimentalGroup.

Experimental Group	N	Mean	SD	MD	SE	Calculated Value of 't' test	Table Value of 't' test
Pre test	20	11.1	0.72	1.9	0.27	7.03	2.09
Post test	20	13	0.73				

Significant at level 0.05



Graph No. 1. Bar graph showing the pre test and post test means of Experimental Group of Hand Grip Strength.

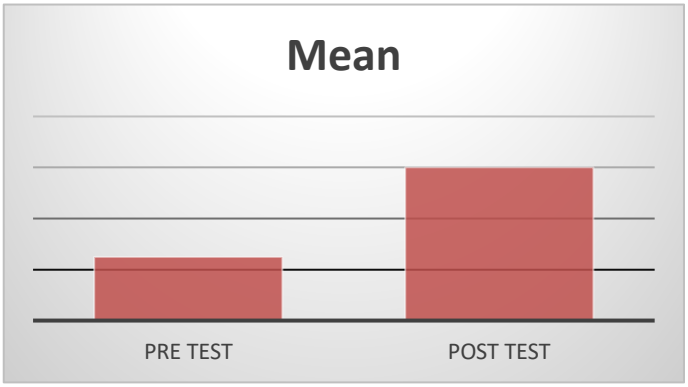
The initial mean value of Hand Grip Strength was measured with the help of hand grip Dynamometer of Experimental group of pre-test was 11.1. The final mean value of Hand Grip Strength of Experimental group of post-test was 13. Thus, the resultant mean difference of pre-test and post-

test was 1.9. Experimental group was found statistically significant. The calculated value of 't' test was 7.03. This value was significant at 0.05 level because the table value of 't' test was greater than 2.09.

Table 2. Showing the pre-test and post-test score of Hand Grip Strength of the ControlGroup.

ControlGroup	N	Mean	SD	MD	SE	Calculated Value of 't' test	Table Value of 't' test
Pre test	20	10.58	0.81	0.6	0.75	0.8	2.09
Post test	20	11.2	0.41				

Significant at level 0.05



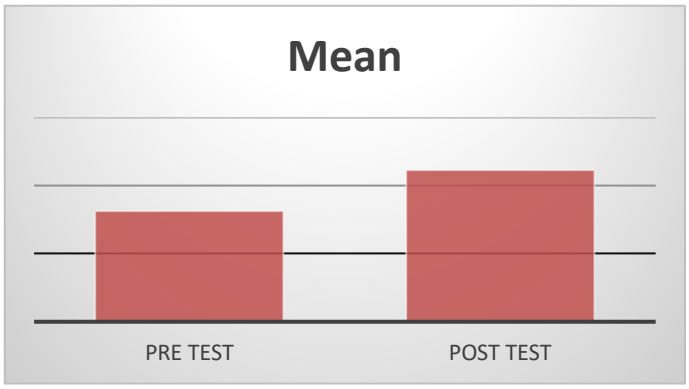
Graph No. 2. Bar graph showing the Pre test and post test means of Control Group of Hand Grip Strength.

The initial mean value of Hand Grip Strength was measured with the help of hand grip Dynamometer of control group of pre-test was 10.58. The final mean value of Hand Grip Strength of control group of post-test was 11.2. Thus, The resultant mean difference of pre-test and post-test was 0.6. Control group was not found statistically significant. The calculated value of 't' test was 0.8. This value was not significant at 0.05 level because the table value of 't' test was smaller than 2.09.

Table 3. Showing the pre-test and post-test score of Flexibilityof the Experimental Group.

Experimental Group	N	Mean	SD	MD	SE	Calculated Value of 't' test	Table Value of 't' test
Pre test	20	8.15	0.74	3	0.27	11.11	2.09
Post test	20	11.15	0.75				

Significant at level 0.05



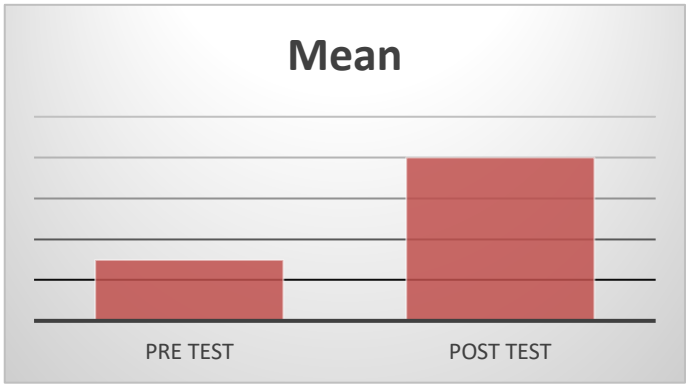
Graph No. 3. Bar graph showing the pre test and post test means of Experimental Group of Flexibility.

The initial mean value of Flexibility was measured with the help of sit and reach Test of Experimental group of pre-testwas 8.15. The final mean value of Flexibility of Experimental group of post-test was 11.15. Thus, the resultant mean difference of pre-test and post-test was 3. Experimental group was found statistically significant. The calculated value of 't' test was 11.11. This value was significant at 0.05 level because the table value of 't' test was greater than 2.09.

Table 4. Showing the pre-test and post-test score of Flexibility of the Control Group.

Control Group	N	Mean	SD	MD	SE	Calculated Value of 't' test	Table Value of 't' test
Pre test	20	7.5	0.94	0.5	0.29	1.72	2.09
Post test	20	8	0.72				

Significant at level 0.05



Graph No. 4. Bar graph showing the pre-test and post-test means of Control Group of Flexibility.

The initial mean value of Flexibility was measured with the help of Sit and Reach Test of control group of pre-test was 7.5. The final mean value of Flexibility of control group of post-test was 8. Thus, the resultant mean difference of pre-test and post-test was 0.5. Control group was not found statistically significant. The calculated value of 't' test was 1.72. This value was not significant at 0.05 level because the table value of 't' test was smaller than 2.09.

Conclusion

The present study confirm that the three weeks medicine ball training program significantly improves hand grip strength and flexibility in college male students. The experimental group showed notable improvements in hand grip strength and flexibility. It was proved that medicine ballexercises were improve hand grip strength and flexibility of college male students. The study shows that the statistically significant difference in the mean difference of hand grip strength and flexibility of experimental group and there was no statistical difference found in hand grip strength and flexibility of control group the probable reason may due to no participation in medicine ball exercises. Medicine ball exercises a highly effective training method for students and athletes.

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