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Effects of gymnastics and rope jump training on physical fitness

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Abstract

The purpose of this research study was to randomly select 30 subject characters aged 12 to 15 years from secondary school students. The purpose of this study here was to study the effects of gymnastics and rope jump training on physical fitness. Due to various training, in the present time the player is prepared with modern methods of training. New techniques of training methods and new equipment are being developed. A six-week training programme was organised for the study. On whom the pre-test was taken before the training program. The final test was conducted after the training. Here the differences between the middlemen were selected at the level of 0.05 by the Least Significant Difference (LSD) post hoc test by applying the One Way Analysis of Covariance test on secondary school subject characters.

Keywords: Gymnastics, rope jump training, physical fitness

Introduction

Physical education and sports activities are now moving very rapidly from the current role to the modern role. At present, due to the developments in the field of sports, there has been a great increase in knowledge and due to new subjects, there are many types of changes in the competition. So today quickly and scientifically developed methods are used in sports training. Different training in sports provides the ability for the players to play the game individually and carry the load during the competition, so that in different types of training, training is given according to different tactics in the game system.

In today's competitive age, there are many reasons for the way the best results and excellent marks are achieved in the Olympics, Asiad or national level competitions. The main reason for this is the training to suit the different types of sports offered in a scientific manner. Only then can a player acquire skills or success. When he can maintain his ability by doing important and difficult actions. The instructor also knows and understands this. In order to develop the physical ability and skills of his player, the trainer makes him perform certain actions, which are known as the training method.

Of these actions, important actions and exercises are done by the instructor to the player which is beneficial to him. Equally important actions that an instructor uses to increase the physical fitness of his player. Its name is 'Gymnastics Training'. The use of this training to physically equip players in the competitive field of physical education and sports is very prevalent.

The benefits of rope jumping exercises come in order to achieve higher levels of physical fitness, so that proper emphasis is given with the development of basic fitness components such as speed, strength, and endurance. There are various means and methods by which one can achieve the required level of fitness, such as individual exercises with and without resistance, and exercises with partner or group exercises using different devices. One of the best ways to achieve these objectives is through the use of a device called jump rope exercise or a long rope. By using rope one can achieve a good level of physical fitness without spending a lot on equipment. One really enjoys learning the technique well after exercising on the rope. A lot of exercises can be done with a rope. This offers a lot of variations and one does not get bored and enjoys doing it all the time.

Physical fitness is the power to participate well in a variety of physical activities without getting tired. This includes the qualities of a person's health and well-being.

Method

The purpose of this study was to study the effects of gymnastics and rope jump training on physical fitness.

The purpose of this research study is to measure the aspects of physical fitness of subject characters in the age group of 12 to 15 years studying in secondary school.

In this study, 30 student brothers in the age group of 12 to 15 years studying in secondary school were randomly selected as subjects. Of the selected subjects, 10 subjects were divided into 'A' gymnastics training group, 10 subjects into 'B' rope jump training group and 10 subject characters into 'C' control group.

Pull-ups, 50-time race, seat and reach test, shuttle run, and

Cooper 12-minute run/gait tests were used to select the evolution.

Statistical process

The differences between the mean were tested for relevance at the level of 0.05 level by the Least Significant Difference (LSD) post hoc test by applying the one way analysis of covariance test to the information obtained from the secondary school group.

Results and Discussion

The results of the study are clear from the following tables.

Table 1: Analysis of covariance of mean scores for gymnastic group and rope jumping group and control group in the Performance of Hand and shoulder muscle strength test

Test	Group			Ancova table			
	Gymnastic training	Rope jumping training	Control group	SS	df	MSS	F
Pre-test mean	4.400	5.400	5.200	5.600	2	2.800	2.333
				32.400	27	1.200	
Post-test mean	5.700	6.500	4.300	24.800	2	12.400	10.239*
				32.700	27	1.211	
Adjusted mean	6.174	6.184	4.142	27.238	2	13.619	28.389*
				12.473	26	0.480	

*Significance level at 0.05 'F' = 0.05 (2, 27) = 3.354 & (2, 26) = 3.369

Table-1 above shows all the statistical data of the medians of the first test and the final test and the co-diffraction analysis 'F'. Similarly, the 'F' ratio of the middle of the hand and shoulder muscle test performance was found to be 2.333. Which was not found to be meaningful at the level of 0.05 compared with the table value (2.866). So, the division of subject characters into the experimental group and the control group was successful. Hand and shoulder muscle strength Test The final test of performance the 'F' ratio of the medians was found to be 10.239. Which was found to be meaningful at the level of 0.05 compared with the table value (2.866). Therefore, the training provided proves to have improved the performance of the subject characters to a meaningful level. The 'F' ratio of the revised medians was found to be 28.389. Which was found to be meaningful at the level of 0.05 compared with the table value (2.874). The difference of the three groups observed between the middlemen modified by the 'F' ratio makes sense.

Therefore, the effect of experimental fitness was observed on the experimental group compared to the control group. In order to see the meaningfulness of the differences between the improved end medians and to examine which group had been more effective in gymnastics and rope jump training, the relevance was checked with the post hoc test LSD between the modified middlemen. Which is shown in Table-2.

Table 2: Analysis of Least Significant Difference (LSD) of Adjusted Mean Scores for gymnastic group and rope jumping group and control group in the Hand and shoulder muscle strength test

Mean			MD	CD
Gymnastic training	Rope jumping training	Control group		
6.174	6.184		0.010	0.637
6.174		4.142	2.032*	
	6.184	4.142	2.042*	

*Significance level at 0.05

Based on the Post Hoc Test (LSD) conducted after the 'F' ratio in Table-2 above is correct, the value of the revolutionary difference is 0.637. The median difference between the gymnastics training group and the rope jump group is 0.010 when compared between the medians of the three groups. Which is less than the revolutionary difference of 0.637. On the basis of which it can be said that there is no meaningful difference between these groups. The median difference between the gymnastics training group and the control training group is 2.032. Which is more than the revolutionary difference of 0.637. On the basis of which it can be said that there is a meaningful difference between these groups. The median difference between the rope jumps training group and the controlled training group is 2.042. Which is more than the revolutionary difference of 0.637. On the basis of which it can be said that there is a meaningful difference between these groups.

Table 3: Analysis of covariance of mean scores for gymnastic group and rope jumping group and control group in the Performance of speed test

Test	Group			ANCOVA TABLE			
	Gymnastic training	Rope jumping training	Control group	SS	df	MSS	F
Pre-test mean	12.790	12.790	12.780	0.001	2	0.000	0.001
				10.614	27	0.393	
Post-test mean	11.070	11.480	12.850	17.378	2	8.689	15.936*
				14.722	27	0.545	
Adjusted mean	11.068	11.478	12.854	17.504	2	8.752	20.912*
				10.881	26	0.419	

*Significance level at 0.05 'F' = 0.05 (2, 27) = 3.354 & (2, 26) = 3.369

Table-3 above shows all the statistical data of the medians of the first test and the final test and the co-diffraction analysis 'F'. Accordingly, the 'F' ratio of the medians of the prior test of the speed test performance was found to be 0.001. Which was not found to be meaningful at the level of 0.05 compared with the table value (2.866). So, the division of subject characters into the experimental group and the control group was successful. The 'F' ratio of the medians of the final test of the speed test performance was found to be 15.936. Which was found to be meaningful at the level of 0.05 compared with the table value (2.866). Therefore, the training provided proves to have improved the performance of the subject characters to a

meaningful level. The 'F' ratio of the revised medians was found to be 20.912. Which was found to be meaningful at the level of 0.05 compared with the table value (2.874). The difference of the three groups observed between the middlemen modified by the 'F' ratio makes sense.

Therefore, the effect of experimental fitness was observed on the experimental group compared to the control group. In order to see the meaningfulness of the differences between the improved end medians and to examine which group had been more effective in gymnastics and rope jump training, the relevance was checked with the post hoc test LSD between the modified middlemen. which is shown in Table-4.

Table 4: Analysis of Least Significant Difference (LSD) of Adjusted Mean Scores for gymnastic group and rope jumping group and control group in the speed test

Mean			MD	CD
Gymnastic training	Rope jumping training	Control group		
11.068	11.478		0.410	0.595
11.068		12.854	1.786*	
	11.478	12.854	1.376*	

*Significance level at 0.05

Based on the Post Hoc Test (LSD) applied after the 'F' ratio in Table-4 above is correct, the value of the revolutionary difference is 0.595. The median difference between the gymnastics training group and the rope jump group is 0.410, compared between the medians of the three groups. Which is less than the revolutionary difference of 0.595. On the basis of which it can be said that there is no meaningful difference between these groups. The median difference between the gymnastics training group and the control training group is

1.786. Which is more than the revolutionary difference of 0.595. On the basis of which it can be said that there is a meaningful difference between these groups. The median difference between the rope jumps training group and the controlled training group is 1.376. Which is more than the revolutionary difference of 0.595. On the basis of which it can be said that there is a meaningful difference between these groups.

Table 5: Analysis of covariance of mean scores for gymnastic group and rope jumping group and control group in the Performance of flexibility test

Test	Group			Ancova table			
	Gymnastic training	Rope jumping training	Control group	SS	df	mss	f
Pre-test mean	8.400	8.800	6.900	20.067	2	10.033	2.488
				108.900	27	4.033	
Post-test mean	10.600	10.200	7.100	73.400	2	36.700	8.196*
				120.900	27	4.478	
Adjusted mean	10.260	9.488	8.152	20.234	2	10.117	9.727*
				27.041	26	1.040	

*Significance level at 0.05 'F' = 0.05 (2, 27) = 3.354 & (2, 26) = 3.369

Table-5 above shows all the statistical data of the medians of the first test and the final test and the co-diffraction analysis 'F'. Accordingly, the 'F' ratio of the middle of the pre-naminability test was found to be 2.488. Which was not found to be meaningful at the level of 0.05 compared with the table value (2.866). So, the division of subject characters into the experimental group and the control group was successful. The 'F' ratio of the middle of the final test of the flexibility test performance was found to be 8.196. Which was found to be meaningful at the level of 0.05 compared with the table value (2.866). Therefore, the training provided proves to have improved the performance of the subject characters to a meaningful level. The 'F' ratio of the revised medians was found to be 9.727. Which was found to be meaningful at the level of 0.05 compared with the table value (2.874). The difference of the three groups observed between the middlemen modified by the 'F' ratio makes sense. Therefore, the effect of experimental fitness was observed on the experimental group compared to the control group. In order to see the meaningfulness of the differences between the improved end medians and to examine which group had been

more effective in gymnastics and rope jump training, the relevance was checked with the post hoc test LSD between the modified middlemen. Which is shown in Table-6.

Table 6: Analysis of Least Significant Difference (LSD) of adjusted mean scores for gymnastic group and rope jumping group and control group in the flexibility test

Mean			MD	CD
Gymnastic training	Rope jumping training	Control group		
10.260	9.488		0.771	0.937
10.260		8.152	2.107*	
	9.488	8.152	1.336*	

*Significance level at 0.05

Based on the Post Hoc Test (LSD) conducted after the 'F' ratio in Table-6 above is correct, the value of the revolutionary difference is 0.937. The median difference between the gymnastics training group and the rope jump group is 0.771, compared between the medians of the three groups. Which is less than the revolutionary difference of 0.937. On the basis of which it can be said that there is no meaningful difference between these groups. The median difference between the

gymnastics training group and the control training group is 2.107. Which is more than the revolutionary difference of 0.937. On the basis of which it can be said that there is a meaningful difference between these groups. The median difference between the rope jumps training group and the

controlled training group is 1.336. Which is more than the revolutionary difference of 0.937. On the basis of which it can be said that there is a meaningful difference between these groups.

Table 7: Analysis of covariance of mean scores for gymnastic group and rope jumping group and control group in the Performance of agility test

Test	Group			Ancova table			
	Gymnastic training	Rope jumping training	Control group	SS	df	MSS	F
Pre-test mean	11.650	10.930	11.650	3.456	2	1.728	2.619
				17.812	27	0.660	
Post-test mean	9.760	9.820	11.970	31.701	2	15.850	58.616*
				7.301	27	0.270	
Adjusted mean	9.748	9.845	11.958	30.092	2	15.046	53.931*
				7.254	26	0.279	

*Significance level at 0.05 'F' = 0.05 (2, 27) = 3.354 & (2, 26) = 3.369

Table 7 above shows all the statistical data of the middle of the first test and the final test and the co-diffusion analysis 'F'. Accordingly, the 'F' ratio of the middle of the agility pre-test was found to be 2.619. Which was not found to be meaningful at the level of 0.05 compared with the table value (2.866). So, the division of subject characters into the experimental group and the control group was successful. The 'F' ratio of the middle of the final test of the agility test performance was found to be 58.616. Which was found to be meaningful at the level of 0.05 compared with the table value (2.866). Therefore, the training provided proves to have improved the performance of the subject characters to a meaningful level.

The 'F' ratio of the corrected medians was found to be 53.931. Which was found to be meaningful at the level of 0.05 compared with the table value (2.874). The difference of the three groups observed between the middlemen modified by the 'F' ratio makes sense.

Therefore, the effect of experimental fitness was observed on the experimental group compared to the control group. In order to see the meaningfulness of the differences between the improved end medians and to examine which group had been more effective in gymnastics and rope jump training, the relevance was checked with the post hoc test LSD between the modified middlemen. Which is shown in Table-8.

Table 8: Analysis of Least Significant Difference (LSD) of adjusted mean scores for gymnastic group and rope jumping group and control group in the agility test

Mean			MD	CD
Gymnastic training	Rope jumping training	Control group		
9.748	9.845		0.097	0.485
9.748		11.958	2.210*	
	9.845	11.958	2.113*	

*Significance level at 0.05

Based on the Post Hoc Test (LSD) conducted after the 'F' ratio in Table-8 above is correct, the value of the revolutionary difference is 0.485. The median difference between the gymnastics training group and the rope jump group is 0.097, compared between the medians of the three groups. Which is less than the revolutionary difference of 0.485. On the basis of which it can be said that there is no meaningful difference between these groups. The median difference between the gymnastics training group and the control training group is

2.210. Which is more than the revolutionary difference of 0.485. On the basis of which it can be said that there is a meaningful difference between these groups. The median difference between the rope jumps training group and the control training group is 2.113. Which is more than the revolutionary difference of 0.485. On the basis of which it can be said that there is a meaningful difference between these groups.

Table 9: Analysis of covariance of mean scores for gymnastic group and rope jumping group and control group in the Performance of cardiovascular endurance test

Test	Group			Ancova table			
	Gymnastic training	Rope jumping training	Control group	SS	df	MSS	F
Pre-test mean	1610.000	1577.000	1621.500	10671.667	2	5335.833	0.257
				560362.500	27	20754.167	
Post-test mean	1641.500	1614.000	1590.000	13281.667	2	6640.833	0.342
				524042.500	27	19408.981	
Adjusted mean	1635.159	1636.858	1573.483	25826.760	2	12913.380	3.935*
				85331.001	26	3281.962	

*Significance level at 0.05 'F' = 0.05 (2, 27) = 3.354 & (2, 26) = 3.369

In table 9 above, all the statistical data of the middle of the first test and the final test and the co-dispersion analysis 'F' are shown. Accordingly, the 'F' ratio of the middle of the pre-transfusion endurance test was found to be 0.257. Which was not found to be meaningful at the level of 0.05 compared with the table value (2.866). So, the division of subject characters

into the experimental group and the control group was successful. The 'F' ratio of the medians of the final test of the circulatory endurance test performance was found to be 0.342. Which was not found to be meaningful at the level of 0.05 compared with the table value (2.866). Therefore, the training provided does not prove to have improved the performance of

the subject characters to a meaningful level. The 'F' ratio of the improved medians was found to be 3.935. Which was found to be meaningful at the level of 0.05 compared with the table value (2.874). The difference of the three groups observed between the middlemen modified by the 'F' ratio makes sense.

Therefore, the effect of experimental fitness was observed on the experimental group compared to the control group. In order to see the meaningfulness of the differences between the improved end medians and to examine which group had been more effective in gymnastics and rope jump training, the relevance was checked with the post hoc test LSD between the modified middlemen. Which is shown in Table-10.

Table 10: Analysis of Least Significant Difference (LSD) of adjusted mean scores for gymnastic group and rope jumping group and control group in the Performance of cardiovascular endurance test

Mean			MD	CD
Gymnastic training	Rope jumping training	Control group		
1635.159	1636.858		1.699	52.649
1635.159		1573.483	61.675*	
	1636.858	1573.483	63.374*	

*Significance level at 0.05

Based on the Post Hoc Test (LSD) conducted after the 'F' ratio in Table-10 above is correct, the value of the revolutionary difference is 52.649. The median difference between the gymnastics training group and the rope jump group is 1.699, compared between the medians of the three groups. Which is less than the revolutionary difference of 52.649. On the basis of which it can be said that there is no meaningful difference between these groups. The median difference between the gymnastics training group and the control training group is 61.675. Which is more than the revolutionary difference of 52.649. On the basis of which it can be said that there is a meaningful difference between these groups. The median difference between the rope jumps training group and the controlled training group is 63.374. Which is more than the revolutionary difference of 52.649. On the basis of which it can be said that there is a meaningful difference between these groups.

Findings

- Improvement in the muscle strength of the hands and shoulders of the subjects was observed after six weeks of gymnastics and rope jump training.
- Improvement in the speed of subject characters was observed after six weeks of gymnastics and rope jump training.
- After six weeks of gymnastics and rope jump training, there was an improvement in the flexibility of the subject characters.
- After six weeks of gymnastics and rope jump training, there was an improvement in the agility of the subject characters.
- After six weeks of gymnastics and rope jump training, there was an improvement in the circulatory endurance of the subjects.

References

1. Uppal AK. Physical fitness: how to develop. Delhi: Friend Publication India; c1992.
2. Kasundra PM. Physical fitness and well-being. Gandhinagar: Rama Prakashan; c2010.
3. Corleton, M/s. Measurement in physical education. 2nd

- ed. New York: The Ronald Press Company; c1980.
4. Gujarat Vyayam Pracharak Mandal. Vyayam Vigyan Kosh-1. Rajpipla: Gujarat Vyayam Pracharak Mandal; c1979.
5. Thani L. Gymnastics: skills and tactics. New Delhi: Lakshya Publication; c2019.
6. Patel KR. Scientific principles of sports training. Gandhinagar: Rama Prakashan; c2001.
7. Patel PM, Desai DB. Physical education equipment kaushalya kala. Ahmedabad: Dhaval Prakashan; c2000.
8. Pandey PK. Howno sports medicine. Jalandhar: M.P. Publisher; c1992.
9. Winkler M. The ultimate jump rope workout. Wiley Publications; c2007.
10. Sharma NP. Krida adhisiksha. New Delhi: Khel Sahitya Kendra; c2005.
11. Singh H. Science of sports training. New Delhi: D.V.M. Publications; c1991.
12. Howell R, Howell M, Uppal AK. Foundation of physical education. New Delhi: Friends Publication; c1994.
13. McBrick E, Nymphius S, Erickson T. The acute effect of heavy load squat and loaded counter movement jumps on sprint performance. J Strength Cond Res. 2005 Nov 4;19(1):100-111.