



IJRASET

International Journal For Research in
Applied Science and Engineering Technology



INTERNATIONAL JOURNAL FOR RESEARCH

IN APPLIED SCIENCE & ENGINEERING TECHNOLOGY

Volume: 10 **Issue:** IV **Month of publication:** April 2022

DOI: <https://doi.org/10.22214/ijraset.2022.41276>

www.ijraset.com

Call:  08813907089

E-mail ID: ijraset@gmail.com

Effect of Different Training Methods on Selected Motor Fitness Variables of College Level Basketball Players

Dr. (Mrs.) Manjulata Nayak¹, Sanjoy Dolai², Prof. Sakti Ranajan Mishra³

¹Govt. College of Physical Education, Kulundi, Sambalpur, Odisha

²Research Scholar, Baliapal College of Physical Education, Baliapal, Balasore, Odisha

³Dept. of Physical Education, Panskura Banamali College (Autonomous) Panskura, Purba Medinipur, W.B.

Abstract: *The purpose of this study was to know the effect of different training methods on selected motor fitness variables of college level basketball players.*

One hundred twenty college level basketball players age ranging between 19 to 22 years acted as subjects and assigned to four groups (three experimental and one control group) with 30 students each. The three experimental groups were Circuit Training, Plyometric Training and Interval Training groups.

Motor fitness variables such as Abdominal Muscle Strength (Sit Up), Flexibility (Sit and Reach) and Cardiovascular Endurance were measured before and after training. All the experimental Groups (Circuit training, Plyometric training and Interval training) was administered with the selected training programme, thrice in a week for a duration of 6 weeks under direct supervision of the researcher.

The analysis of data revealed that the three experimental groups, showed significant gains in performance of selected motor fitness variables after administration of training for duration of 6 weeks. The control group did not show any significant increase in the performance.

Keywords: *Circuit Training, Plyometric Training, Interval Training, Motor fitness variables.*

I. INTRODUCTION

A fit body is an asset to any game. The present era stresses upon sports and games involving high skill and expertise. Super performances not only depends upon skill and expertise but also requires a high degree of physical fitness of the players. Thus, fitness is the key factor and base of the super performances.

Preparing a skilled player depends upon the provision of type of training to the player. Sports training refer to specialized strategies and methods of exercise used in various sports to develop players and athletes and prepare them for performing in sporting events. *The purpose of this study was to know effect of different training methods on selected motor fitness variables of college level Basketball players*

II. METHODOLOGY

One hundred twenty college level basketball players, age ranging between 19 to 22 years acted as subjects and were randomly assigned to four groups i.e., three experimental groups and one control group, consisting of 30 students each. The experimental treatments were also assigned to the groups at random.

The Experimental Groups (three groups) were given Circuit Training, Plyometric Training and Interval Training respectively. The control group being kept away from the training schedule and continued in performing normal college programme. Keeping the feasibility criterion in mind, especially in the case of availability of instruments, the following variables of motor fitness were chosen: 1. Muscle Strength (Sit Up), 2. Flexibility (Sit and Reach) and 3. Cardiovascular Endurance (1 Mile Run), All the experimental Groups (Circuit training, Plyometric training and Interval training) were administered with the selected exercises, thrice in a week for a duration of 6 weeks under direct supervision of the researcher.

III. FINDINGS

The statistical analysis of data on motor fitness components of subjects belonging to three experimental groups and one control group, each comprising of thirty subjects, is presented below.

TABLE – 1(Significance of Difference between Pre-Test and Post-Test Means of the three Experimental Groups and the Control Group in Sit Ups)

| Groups | Pre-test mean±SE | Post-test mean±SE | Diff. between means | SE | 't' ratio |
|---------------------|------------------|-------------------|---------------------|-------|-----------|
| Circuit training | 24.667±0.830 | 26.867±0.803 | 2.200 | 0.443 | 4.965* |
| Plyometric training | 24.767±0.756 | 28.567±0.474 | 3.800 | 0.416 | 9.127* |
| Interval training | 24.967±0.968 | 25.967±0.828 | 1.000 | 0.418 | 2.392* |
| Control | 24.633±0.977 | 24.367±0.796 | 0.266 | 0.258 | 1.034 |

* Significant at 0.05 level of confidence, $t'_{0.05}(29) = 2.045$. Table 1 clearly reveals that all the experimental groups improved significantly yielding 't' value of 4.965, 9.127 and 2.392 with regard to circuit training, plyometric training and interval training, respectively, where as the control group did not show any significant improvement in sit ups performance of subjects indicating 't' values of 1.034. The needed 't' value for significance at 0.05 level of confidence with 29 degrees of freedom was 2.045.

TABLE – 2 (Analysis of Variance and Covariance of the Means of three Experimental Groups and the Control Group in Sit Ups)

| | Circuit training | Plyometric training | Interval training | Control | Sum of squares | df | Mean square | F ratio |
|--------------------------|------------------|---------------------|-------------------|--------------|-------------------------|----------|------------------|---------|
| Pre-test means | 24.667±0.830 | 24.767±0.756 | 24.967±0.968 | 24.633±0.977 | B 2.025 W 2741.967 | 3 116 | 0.675 23.638 | 0.029 |
| Post-test means | 26.867±0.803 | 28.567±0.474 | 25.967±0.828 | 24.367±0.796 | B 276.825 W 1904.767 | 3 116 | 92.275 16.420 | 5.620* |
| Adjusted post-test means | 26.935±0.323 | 28.560±0.323 | 25.810±0.323 | 24.460±0.323 | B 271.697 W 360.672 | 3 115 | 90.566 3.136 | 28.877* |

* Significant at 0.05 level of confidence, N = 120, B = Between group variance, W = Within group variance. The analysis of covariance for sit ups showed that the resultant 'F' ratio of 0.029 was not significant in case of pre test means. The post test means yielded 'F' ratio of 5.620, which was found to be significant. The adjusted final means yielded the 'F' ratio of 28.877 and was found significant. The 'F' ratio, needed for significance at 0.05 level of confidence (df 3, 116) was 2.680.

TABLE – 3 (Paired Adjusted Final Means and Differences between Means for the three Experimental Groups and the Control Group in Sit Ups)

| Circuit training | Plyometric training | Interval training | Control | Difference between means | Critical dif. for adjusted mean |
|------------------|---------------------|-------------------|---------|--------------------------|---------------------------------|
| 26.935 | 28.560 | | | 1.525* | 1.323 |
| 26.935 | | 25.810 | | 1.125 | 1.323 |
| 26.935 | | | 24.460 | 2.475* | 1.323 |
| | 28.560 | 25.810 | | 2.750* | 1.323 |
| | 28.560 | | 24.460 | 4.100* | 1.323 |
| | | 25.810 | 24.460 | 1.350* | 1.323 |

* Significance at 0.05 level It was clear from the Table 3 that the mean differences with respect to performance in sit ups of all the experimental groups were found to be significantly greater than that of control group. Plyometric training group was found to be significantly better than both circuit training and interval training. However, no significant difference between circuit training group and interval training group was found with respect to sit ups performance.

TABLE – 4(Significance of Difference between Pre-Test and Post-Test Means of the three Experimental Groups and the Control Group in One Mile Run/Walk)

| Groups | Pre-test mean±SE | Post-test mean±SE | Diff. between means | SE | 't' ratio |
|---------------------|------------------|-------------------|---------------------|-------|-----------|
| Circuit training | 12.855±0.242 | 10.170±0.174 | 2.685 | 0.102 | 26.451* |
| Plyometric training | 12.877±0.193 | 9.891±0.160 | 2.985 | 0.056 | 53.738* |
| Interval training | 12.869±0.217 | 10.080±0.169 | 2.789 | 0.092 | 30.208* |
| Control | 12.980±0.228 | 12.896±0.201 | 0.084 | 0.109 | 0.773 |

* Significant at 0.05 level of confidence, $t_{0.05}(29) = 2.045$. Table 4 clearly reveals that all the experimental groups improved significantly yielding 't' value of 26.451, 53.738 and 30.208 with regard to circuit training, plyometric training and interval training, respectively, where as the control group did not show any significant improvement in sit ups performance of subjects indicating 't' values of 0.773. The needed 't' value for significance at 0.05 level of confidence with 29 degrees of freedom was 2.045

TABLE – 5 (Analysis of Variance and Covariance of the Means of three Experimental Groups and the Control Group in One Mile Run/Walk)

| | Circuit training | Plyometric training | Interval training | Control | Sum of squares | df | Mean square | F ratio |
|--------------------------|------------------|---------------------|-------------------|---------------|------------------------|----------|-----------------|----------|
| Pre-test means | 12.855 ±0.242 | 12.877 ±0.193 | 12.869 ±0.217 | 12.980 ±0.228 | B 0.297 W 169.237 | 3 116 | 0.099 1.459 | 0.068 |
| Post-test means | 10.170 ±0.174 | 9.891 ±0.160 | 10.080 ±0.169 | 12.896 ±0.201 | B 183.827 W 108.831 | 3 116 | 61.276 0.938 | 65.312* |
| Adjusted post-test means | 10.199 ±0.071 | 9.905 ±0.071 | 10.100 ±0.071 | 12.833 ±0.071 | B 173.145 W 17.508 | 3 115 | 57.715 0.152 | 379.098* |

* Significant at 0.05 level of confidence , N = 120, B = Between group variance, W = Within group variance. The analysis of covariance for one mile run/walk showed that the resultant 'F' ratio of 0.068 was not significant in case of pre test means. The post test means yielded 'F' ratio of 65.312, which was found to be significant. The adjusted final means yielded the 'F' ratio of 379.098 and was found to be highly significant. The 'F' ratio, needed for significance at 0.05 level of confidence (df 3, 116) was 2.680.

TABLE – 6 (Paired Adjusted Final Means and Differences between Means for the three Experimental Groups and the Control Group in One Mile Run/Walk)

| Circuit training | Plyometric training | Interval training | Control | Diff. between means | Critical diff. for adjusted mean |
|------------------|---------------------|-------------------|---------|---------------------|----------------------------------|
| 10.199 | 9.905 | | | 0.294 | 1.717 |
| 10.199 | | 10.100 | | 0.099 | 1.717 |
| 10.199 | | | 12.833 | 2.634* | 1.717 |
| | 9.905 | 10.100 | | 0.195 | 1.717 |
| | 9.905 | | 12.833 | 2.828* | 1.717 |
| | | 10.100 | 12.833 | 2.733* | 1.717 |

* Significance at 0.05 level. It is clear from the Table 6 that the mean differences with respect to performance in one mile run/walk of all the experimental groups were found to be significantly better than that of control group with decreased numerical value. However, no significant difference among the experimental groups was found with respect to one mile run/walk performance.

TABLE – 7 (Significance of Difference between Pre-Test and Post-Test Means of the three Experimental Groups and the Control Group in Sit and Reach)

| Groups | Pre-test mean±SE | Post-test mean±SE | Diff. between means | SE | 't' ratio |
|---------------------|------------------|-------------------|---------------------|-------|-----------|
| Circuit training | 25.900±0.522 | 29.733±0.431 | 3.833 | 0.292 | 13.129* |
| Plyometric training | 25.800±0.463 | 29.633±0.417 | 3.833 | 0.250 | 15.363* |
| Interval training | 25.800±0.564 | 29.833±0.431 | 4.033 | 0.293 | 13.740* |
| Control | 25.867±0.552 | 25.833±0.424 | 0.033 | 0.206 | 0.162 |

* Significant at 0.05 level of confidence, $t_{0.05} (29) = 2.045$. Table 13 reveals that all the experimental groups improved significantly yielding 't' value of 13.129, 15.363 and 13.740 with regard to circuit training, plyometric training and interval training, respectively, where as the control group did not show any significant improvement in sit and reach performance of subjects indicating 't' values of 0.162. The needed 't' value for significance at 0.05 level of confidence with 29 degrees of freedom was 2.045

TABLE – 8 (Analysis of Variance and Covariance of the Means of three Experimental Groups and the Control Group in Sit and Reach)

| | Circuit training | Plyometric training | Interval training | Control | Sum of squares | df | Mean square | F ratio |
|--------------------------|------------------|---------------------|-------------------|---------------|------------------------|----------|------------------|---------|
| Pre-test means | 25.900 ±0.522 | 25.800 ±0.463 | 25.800±0.564 | 25.867±0.552 | B 0.225 W 965.762 | 3 116 | 0.075 8.326 | 0.009 |
| Post-test means | 29.733 ±0.431 | 29.633 ±0.417 | 29.833±0.431 | 25.833±0.424 | B 342.825 W 631.167 | 3 116 | 114.275 5.441 | 21.002* |
| Adjusted post-test means | 29.692 ±0.212 | 29.663 ±0.212 | 29.863 ±0.212 | 29.816 ±0.212 | B 347.035 W 154.720 | 3 115 | 115.678 1.345 | 85.981* |

* Significant at 0.05 level of confidence, N = 120, B = Between group variance, W = Within group variance. The analyses of variance for sit and reach test performance showed that the resultant 'F' ratio of 0.009 was not significant in case of pre test means. The post test means yielded 'F' ratio of 21.002, which was found to be significant. The adjusted final means yielded the 'F' ratio of 85.981 and was found significant. The 'F' ratio, needed for significance at 0.05 level of confidence (df 3, 116) was 2.680.

TABLE – 9 (Paired Adjusted Final Means and Differences between Means for the three Experimental Groups and the Control Group in Sit and Reach)

| Circuit training | Plyometric training | Interval training | Control | Diff. between means | Critical diff. for adjusted mean |
|------------------|---------------------|-------------------|---------|---------------------|----------------------------------|
| 29.692 | 29.663 | | | 0.029 | 0.032 |
| 29.692 | | 29.863 | | 0.171* | 0.032 |
| 29.692 | | | 29.816 | 0.124* | 0.032 |
| | 29.663 | 29.863 | | 0.200* | 0.032 |
| | 29.663 | | 29.816 | 0.153* | 0.032 |
| | | 29.863 | 29.816 | 0.047* | 0.032 |





* Significance at 0.05 level, It is evident from the Table 15 that the mean differences with respect to sit and reach of all the experimental groups were found to be significantly greater than that of control group. Further, significant difference between interval training group and other two experimental groups was observed making interval group significantly superior. However, no significant difference was found between circuit and plyometric training group with respect to sit and reach performance.





IV. CONCLUSION

The analysis of data revealed that the three experimental groups, administered with circuit training, plyometric training and interval training showed significant gains in performance of motor fitness components after administration of training for duration of 6 weeks. The control group did not show any significant increase in the performance of any variable under study. Plyometric training schedule could enhance the performance in sit ups with higher intensity than both circuit and interval training. Similarly interval training could prove to be significantly better than both circuit and plyometric training towards enhancing performance of subjects in sit and reach test. Above all each fitness parameters under present study was improved through all three trainings. The results of the study coincided with the general conception that plyometric exercise improves speed and agility, circuit training helps improve strength and endurance and interval training helps flexibility and endurance of the players in a progressive manner.

REFERENCES

- [1] Mishra, S.R. (2008) Effect of Circuit Training on the Muscle Power. Readings on Principle and Practices of Physical Education, Human Movement Series, Vol. I
- [2] Mishra, S.R.. (2011) Effects of a Plyometric Training Programme on Selected Physiological Variables of Adolescent School Going Boys. Journal Physical Education and Sports Science, Online Journal, National association of Physical Education and Sports Science, Volume 2/1 (<http://www.napess.org>).
- [3] Mishra, S.R., Karak, Kalidas and Sen, Bipul (2015) The Effect of Plyometric Training Programme on Volleyball Players. Global Journal for Research Analysis, Volume 4/ Issue 5/ May 2015

| | | | | | | | | | | | | | | | | | |
|--|--|------------------|--|----------------------------------|---|---------------------------|-------------|--------------------|-----------|------------------------------------|----------|--|--|--|--|--|--|
|  Boarding Pass (Web Check-in) Duplicate | | | | | Your Departure Terminal is T1  | | | | | | | | | | | | |
| DASH/SUSANTA KUMAR MR | | | | | BHUBANESWAR (T1) To KOLKATA | | | | | DASH/SUSANTA KUMAR MR | | | | | | | |
| Flight 6E 6181 | | Gate - | | Boarding Time 0545 Hrs | | Boarding Zone 2 | | Seat 15E | | BHUBANESWAR (T1) To KOLKATA | | | | | | | |
|  | | | | | Date | | 13 Mar 2022 | | Departure | | 0630 Hrs | |  | | | | |
| | | | | | Seq | | 0091 | | Services | | NIL | | | | | | |
| Gate is subject to change and will close 25 minutes prior to departure. | | | | | Date | | 13 Mar 2022 | | Departure | | 1010 Hrs | | Seat 15E Seq 0091 | | | | |
| | | | | | Seq | | 0039 | | Services | | NIL | | | | | | |

| | | | | | | | | | | | | | | | | | |
|--|--|------------------|--|----------------------------------|---|---------------------------|-------------|-------------------|-----------|------------------------------|----------|--|--|--|--|--|--|
|  Boarding Pass (Web Check-in) Duplicate | | | | |  | | | | | | | | | | | | |
| DASH/SUSANTA KUMAR MR | | | | | KOLKATA To IMPHAL | | | | | DASH/SUSANTA KUMAR MR | | | | | | | |
| Flight 6E 6014 | | Gate - | | Boarding Time 0925 Hrs | | Boarding Zone 3 | | Seat 4B | | KOLKATA To IMPHAL | | | | | | | |
|  | | | | | Date | | 13 Mar 2022 | | Departure | | 1010 Hrs | |  | | | | |
| | | | | | Seq | | 0039 | | Services | | NIL | | | | | | |
| Gate is subject to change and will close 25 minutes prior to departure. | | | | | Date | | 13 Mar 2022 | | Departure | | 1010 Hrs | | Seat 4B Seq 0039 | | | | |
| | | | | | Seq | | 0039 | | Services | | NIL | | | | | | |



10.22214/IJRASET



45.98



IMPACT FACTOR:
7.129



IMPACT FACTOR:
7.429



INTERNATIONAL JOURNAL FOR RESEARCH

IN APPLIED SCIENCE & ENGINEERING TECHNOLOGY

Call : 08813907089  (24*7 Support on Whatsapp)