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# Effect of Core Exercises Program and Yoga Practice on Muscular Endurance among Physical Education Students

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***Abstract – The present study was undertaken to analyze the effect of isolated and combined effect of core exercises program and yoga practice on muscular endurance among physical education students. The investigator has selected N=48 male physical education students were selected from Faculty of Physical Education and Yoga, ICFAI University, Tripura, India and their age range from eighteen to twenty five years as per their college record. The selected physical education students for the study were divided into four equal groups n=15 and designated as experimental group 'A' experimental group 'B' experimental group 'C' and control group 'D'. Core exercises training were given to group 'A' yoga practice were given to group 'B', Combined training of core exercises and yoga practice were given to group 'C' and the 'CG' control group 'D' were restricted to participate in any activities apart from their curriculum activities. The trainings were given for a period of twelve weeks. The data were collected before and after the training period by conducting bent knee sit ups test. The obtained data's were analyzed by Analysis of Covariance (ANCOVA). The level of significant was fixed at 0.05 levels. The results of the study showed that core exercises, yoga practices and combined training significantly improved muscular endurance performance level of the physical education students when comparative with control group.***

***Keywords: – Core Exercises, Yoga, Muscular Endurance.***

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## INTRODUCTION

Physical exercise is any movement produced by skeletal muscles that result in expenditure of energy that enhances physical fitness, overall health and well being. The strengthen of core muscles are essential in all sports and games to execute the specific task perfectly (Aditya 2018). The term core specifically lumbo pelvic region of the body (Gill 2001). Core strength exercises refers to core muscles ability to produce force, where as core muscles endurance means ability of the athletes to keep on producing force and sustain the physical activities (Aditya.,2017).

The term "yoga" and the English word "yoke" are derived from Sanskrit root"yuj" which mean union. Yoga improves dexterity, strength and musculoskeletal coordination of the practitioners. Postures assumed during yoga practice are mainly isometric exercises which provide optimally maintain stretch on muscles. Series of asana involve assumption of the pose and followed by counter pose i.e., it involves coordinated action of synergistic and antagonistic muscles which brings increased steadiness, strength, stamina, flexibility, endurance, anaerobic power, better neuromuscular coordination and improved orthostatic tolerance (Tarak 2015).

## STATEMENT OF THE PROBLEM:

The purpose of the study was to investigate the "effect of isolated and combined core exercises program and yoga practice on muscular endurance among physical education students.

## OBJECTIVES OF THIS STUDY

1. To measure the influence of core exercises program treatment on muscular endurance of physical education students.
2. To evaluate the impact of yoga practice treatment on muscular endurance of physical education students.

3. The examined the effect of combined training treatment on muscular endurance of physical education students.

4. To understand the changes between core exercises, yoga practices and combined training on muscular endurance of physical education students.

## HYPOTHESIS:

- It was hypothesis that there would be a significant enhancement in muscular endurance after the twelve weeks of training in core exercises training group, yoga practice training group and combined training group [core exercises and yoga practice] group when compared with control group physical education students.

- It was hypothesis that combined training group physical education students will be superior to the core exercises training group and yoga practice training group physical education students on muscular endurance performance.

## METHODOLOGY:

The purpose of this study was to find out the effect of isolated and combined core exercises program and yoga practice on muscular endurance among physical education students. To achieve the purpose of this study investigator has selected N=48 male physical education students were selected from Faculty of Physical Education and Yoga, ICFAI University, Tripura, India and their age range from eighteen to twenty five years as per their college record. The subjects chosen for study was divided into four groups each groups consisted of twelve physical education students and designated as experimental group 'A' experimental group 'B' experimental group 'C' and control group 'D'. Core exercises training were given to group 'A' [CETG] yoga practice training were given to group 'B' [YTG], Combined training of core exercises and yoga practice training were given to group 'C' [CCEYTG] and the 'CG' control group 'D' was restricted to participate in any of the training programme other than their regular activities.

Training was given three days in a week for twelve weeks to CETG, YTG and CCEYTG physical education students. The subject were tested on muscular endurance at the beginning (Pre-test) and at the end of the experimental period (Post-test). To measure the muscular endurance performance level bent knee sit up test were used respectively because of their simplicity and availability of necessary facilities, instrument and equipment's. The analysis of data on muscular endurance test data have been examine by ANCOVA in order to determine the differences if any among the group at pre and posttest.

**Table – I**

**Analysis of Covariance of CETG, YTG, CCEYTG and CG physical education students' muscular endurance performance [In number]**

| TEST | CETG | YTG | CCEYTG | CG | SOURCE OF VARIANCE | SUM OF SQUARES | df | MEAN SQUARES | OBTAINED F |
|---|---|---|---|---|---|---|---|---|---|
| Pre Test Mean SD | 27.16 4.93 | 27.91 4.27 | 27.83 3.27 | 28.00 3.93 | Between | 5.22 | 3 | 1.74 | 0.101 |
| | | | | | Within | 756.25 | 44 | 17.18 | |
| Post Test Mean SD | 36.75 2.82 | 32.08 4.37 | 35.08 1.31 | 26.41 3.91 | Between | 742.66 | 3 | 247.55 | 22.36* |
| | | | | | Within | 487.00 | 44 | 11.06 | |
| Adjusted Post Test Mean | 37.09 | 31.96 | 35.96 | 26.25 | Between | 798.18 | 3 | 266.06 | 56.80* |
| | | | | | Within | 201.39 | 43 | 4.68 | |
| Mean Diff | 9.59 | 4.17 | 7.25 | 1.59 | - | - | - | - | - |

*Significant at 0.05 level of confidence
Table value F-ratio at 0.05 level of confidence for 3 and 44 (df) =2.82, 3 and 43 (df) =2.82.
*Significant

The above table-I shows that there is a significant difference on muscular endurance performance level among the four groups such as Core exercises training group [CETG] yoga practice training group [YTG], Combined training of core exercises and yoga practice training group [CCEYTG] and the 'CG' control group. Since the calculated 'F' value required being significant at 0.05 level for d/f 3, 44 and 3, 43 are 2.82 and 2.82, but the calculated values of muscular endurance post and adjusted posttest 'F' values are 22.36 and 56.80 respectively. Which are higher than the tabulated value. Since the obtained 'F' ratio is found significant.

**Table – II**

**Scheffes Post hoc test for mean difference between CETG, YTG, CCEYTG and CG physical education students muscular endurance performance [In number]**

| ADJUSTED POSTTEST MEANS VALUES | | | | | Required C I |
|---|---|---|---|---|---|
| CETG | YTG | CCEYTG | CG | Mean Difference | |
| 37.09 | 31.96 | - | - | 5.13* | 2.56 |
| 37.09 | - | 35.96 | - | 1.13 | 2.56 |
| 37.09 | - | - | 26.25 | 10.84* | 2.56 |
| - | 31.96 | 35.96 | - | 4.00* | 2.56 |
| - | 31.96 | - | 26.25 | 5.71* | 2.56 |
| - | - | 35.96 | 26.25 | 9.71* | 2.56 |

*Significant at 0.05 level of confidence*

The mean difference CETG and YTG, CETG and CG, YTG and CCEYTG, YTG and CCEYTG, YTG and CG and CCEYTG and CG were 5.13, 10.84, 4.00, 5.71 and 9.71 which are higher than the CI value 2.56. Therefore study approved that there is significant differences exist between above groups on physical education students.

Whereas mean differences between CETG and CCEYTG was 1.13 lower than the CI value 2.56. Therefore the study confirmed that there is no significant differences exist between the groups.

The prior test mean value, post test mean values and adjusted post test mean values of CETG, YTG, CCEYTG and CG physical educations muscular endurance performance displayed in line graph

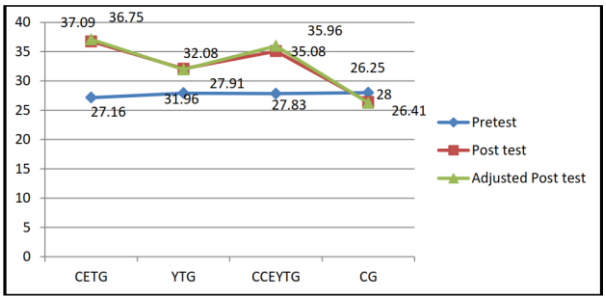


**Figure –I display the line graph of pre test, post test and adjusted post test mean values for muscular endurance performance of CETG, YTG, CCEYTG and CG physical education students**

## DISCUSSION ON HYPOTHESIS:

- In the first hypothesis it was stated that there will be a significant improvement in muscular endurance performance after the twelve weeks of training in core exercises training group physical education students, yoga practice training group physical education students and combined training group [core exercises and yoga practices] group physical education students when compared with control group physical educations. The result of the study found that experimental group's physical education students muscular endurance performance level improved when compared with control group. Hence the research hypothesis is accepted.

- In second hypothesis mention that combined training group physical education students will be superior to the core exercises training group and yoga practice training group physical education students. The study found that combined training group physical education students not given best performance when comparison with core exercises training group physical education. Hence research hypothesis rejected.

## DISCUSSION AND FINDINGS:

The isolated and combined exercises of core exercises and yoga practices has beneficial positive impact to increase the muscular endurance performance of the male physical education students Sekendiz*et al.,* (2010), found the fact that Swiss ball core strengthening exercise significantly improve muscular endurance in sedentary women. Aditya (2014) found that muscular endurance of the soccer players enhanced with the impact of complex training with core exercises programme. Shahidi*et al.,* (2012), found that two resistance training is probably effective for improving low body muscles endurance and abdominal muscles endurance in Soccer players. Tan (2010), suggested that resistance training improve running economy. Patra& Kumar (2013), their study reported that core stabilization and endurance training [CSETG] and endurance training [ET] significantly improve trunk extensor endurance on low back pain patients.

## CONCLUSIONS:

The scoring number of three empirical groups increased with the isolated and combined core exercises and yoga practices. The combined core exercises and yogic practice training group physical education students and core exercises training group physical education students were more effective to score more number of bent knee sit ups than yoga practice training group physical education students.

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