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**Original Research Article**

# Effects of Four Weeks Intervention of Yogic Practices on Cricket Specific Motor Fitness

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## Abstract

The potentiality of yogic practices to improve physical and mental ability is well-known. The inclusion of yogic practice in cricket training protocol is a controversial topic. Plenty of research literature suggested that yogic asana improves physical fitness and controls competition pressure as well as match stress. So, the study was carried out to find out the effect of yogic practice schedule on cricket specific motor fitness. Thirty male district level cricketers with a mean age of 17.8 ± 1.6 years were selected and randomly divided into two equal groups. One group underwent through selected yogic asana practices along with their regular training and another group did not include yogic asana practice in their training schedule. Basic physical and physiological parameters along with some cricket specific motor fitness components were measured before and after four weeks of yogic practices. The basic physical appearances of two groups were merely similar and a low resting heart rate has been observed among cricketers. Four weeks of yogic practice significantly improved the muscle endurance, agility and balance. A positive effect has also been observed in the predicted $\dot{V}O_2$ max. The study revealed inclusion of yogic practice in training sessions for cricketers plays an important role to improve motor fitness which is a key factor of performance.

**Keywords:** Cricket, Motor fitness, Physical fitness, Yogic practice.



## INTRODUCTION

Cricket is a popular field-based team sport. Nowadays it is played at the international level throughout the years. Cricket is played in three formats (T-20, one day and test). Different formats of cricket imply different physical and physiological demands. Competition pressure increases mental stress, irritability and intolerance which decrease the playing ability of the crickets. According to historical research, Yogic asana develops the physical, mental, emotional and spiritual aspects of an individual [1]. Yogic practice encouraged the muscles, nervous system, endocrine glands and internal organs to function properly [2]. In a review article it has been reported that yoga may be used as an effective therapeutic means for reducing stress and anxiety, improving autonomic function by triggering neuro-hormonal mechanism [3]. From this point of view, yogic practice may help to reduce training and competition stress which largely affects match performance. Cricket is a skill-oriented game and physical fitness also plays an important role because to execute a motor skill, physical fitness is required. There are numerous research works in world literature on the positive effect of yogic asana on different sports and sedentary populations but a few research works have been done on cricketers. There are hardly any data and yogic training scheduled available in the Indian context. Keeping in mind this gap in knowledge, this pilot study will focus on finding out a suitable yogic practice schedule that can improve cricket specific motor fitness and its effect on performance of regional cricketers.

## METHODS

### The Volunteers

Thirty (30) male district level cricketers were purposively selected from a regional training camp of West Bengal as volunteer. A brochure has been provided to all the volunteers containing outlining of the training, purpose, procedures, and benefits and risks of the study. The volunteers as well as the coach gladly accept the yogic training protocol, schedule and procedures. A hand made brief questionnaire regarding general health, personal information and written consent form were duly filled by the volunteers before the test. The volunteers who were under 18 years,

consent form were duly signed by their parents. The study and training protocol was approved according to the code of academic and research ethics of the University of Kalyani. All the volunteers trained for more than four years and represented their districts in state competitions.

**Training protocols**

All the volunteers (n=30) were randomly categorized into two groups namely Experimental Group (EG) and Control Group (CG). Fifteen (15) volunteers were randomly assigned for each group (EG; n=15, CG; n=15). As per the direction of yoga expert only selected yogic asana have been included in the practice scheduled for EG. A Yoga trainer has been engaged for EG to give effective and perfect practice of the selected asana. All the volunteers of EG practiced the yogic asana just before their practice session. The data were collected under natural environmental conditions in the morning (between 8:00 am to 9:00 am). No yogic asana were included in the practice scheduled of CG. Selected yogic asana for the cricketers of EG are presented in Table 1.

**Table-1: Prescribed asana for EG cricketers [4].**

| Asana | Repetitions | Rest between asana (Sec) | Frequency/ week |
|---|---|---|---|
| Sun Salutation | 4 | 60 | ~ 30 minutes * 5 days |
| Uttanasana | 4 | 15 | |
| Chakrasana | 4 | 15 | |
| Vrikshasana | 4 | 15 | |
| Lolasana | 4 | 15 | |

**DATA COLLECTION PROCEDURES**

All the volunteers underwent some cricket specific motor fitness tests along with some basic physical and physiological measurements. The volunteers did not take any medicines or other drugs during the training period. All the volunteers were free from any cardiovascular disease as was confirmed from the ECG reports. The heart rate of the cricketers was monitored at resting condition in the supine position to evaluate resting heart rate. Selected cricket specific motor fitness variables along with RHR were measured before and after four weeks of training. The list of measuring parameters and name of test are shown in table 2.

**Table-2: Measuring parameters of the cricketers**

| Measuring Variables | Name of the test |
|---|---|
| Resting heart rate [5] | Monitoring RR intervals |
| Muscular endurance (abdominal) [6] | Sit ups |
| Speed [6] | 50 meter dash |
| Agility [6] | 4 * 10 meter shuttle run |
| Cardiovascular endurance [7] | Queens college step test |
| Balance [6] | Stork stand test |

**Statistical procedures**

Descriptive statistics such as mean, standard deviation were calculated. Data were analysed separately for EG and CG. The hypotheses of normality and homogeneity of the variance were analysed via Anderson-Darling test. Parametric analysis was performed because majority of the data were normally distributed. To reveal the differences between pre and post-test mean of CG & EG the paired sample t-test was performed. Statistically significant level was considered as $\alpha \leq 0.05$ level. Statistical analyses and graphical expression were performed using the free statistical software Gnumeric spreadsheet (1.12.48).

## RESULTS

Basic physical and personal characteristics of the group volunteers are displayed in table 3.

**Table-3: Physical and personal information of the cricketers.**

| Variables | Controlled group (CG) | | Experimental group (EG) | |
|---|---|---|---|---|
| | Pre-test | Post-test | Pre-test | Post-test |
| Age (years) | 18.0 ± 1.5 | 18.0 ± 1.5 | 17.6 ± 1.5 | 17.6 ± 1.5 |
| Standing height (meter) | 1.699 ± 0.047 | 1.699 ± 0.047 | 1.704 ± 0.041 | 1.704 ± 0.041 |
| Body mass (kg) | 62.6 ± 5.9 | 62.3 ± 5.8 | 61.4 ± 8.1 | 61.2 ± 7.8 |
| BMI ($kg/m^2$) | 21.6 ± 1.6 | 21.6 ± 1.7 | 21.2 ± 2.4 | 21.2 ± 2.5 |

No significant differences have been observed in basic physical and personal characteristics of both groups.

**Resting Heart Rate of the cricketers**

RHR variation of two groups of volunteers with 95% confidence intervals from mean has been displayed in figure 1.

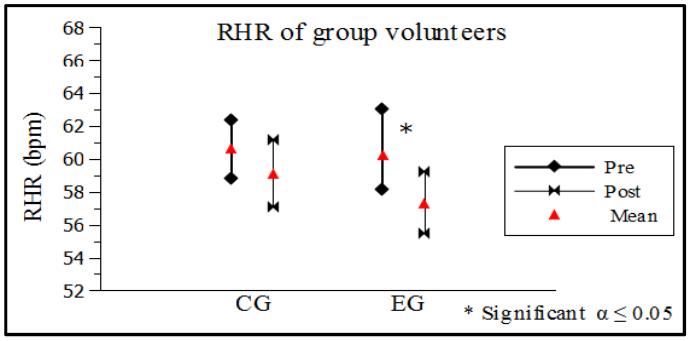


**Fig-1: Graphical representation of RHR variation (Min-Max) of two group volunteers**

The mean RHR of CG and EG has been found 60.6 ± 0.8 bpm and 61.2 ± 1.4 bpm at the time of pre-test and 59.1 ± 0.9 bpm and 57.3 ± 0.8 bpm during post-test. RHR has been decreases in post-test of both groups. The mean difference of RHR between pre-test and post-test of CG and EG has been found 1.5 bpm and 3.3 bpm (lower than pre-test) respectively. A significant difference in RHR has been observed in paired samples t- test between pre and post-test of EG ($P \leq 0.0003$).

**Muscle Strength Endurance**

Graphical representation of abdominal muscle endurance has been presented in figure 2.

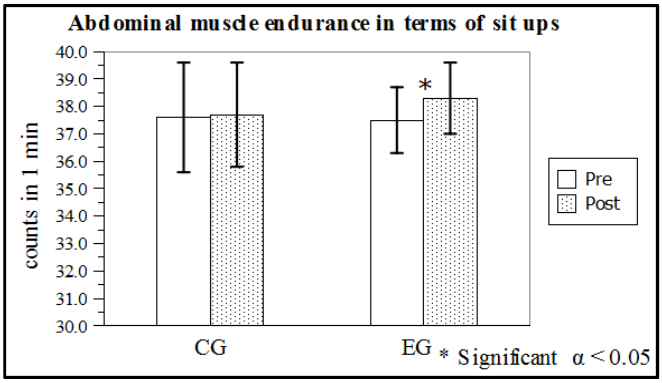


**Fig-2: Comparison of pre- post abdominal muscle endurance of two groups**

A statistically significant difference has been observed in paired samples t- test between pre and post-test of EG. In the comparison mean difference has been found 0.87 and 'p' value has been found 0.048. No significant difference has been observed in CG, between the pre and post-test means at 0.05 levels.

**Speed**

Effects of yogic training on speed has been displayed by box plot in the figure 3

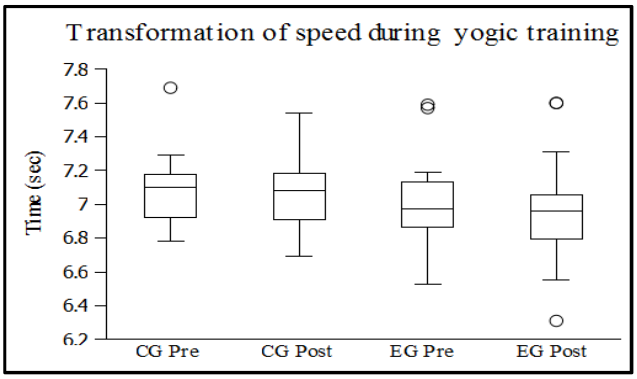


**Fig-3: Transformation of speed of CG and EG group volunteers**

No significant difference has been observed in pre-test post-test comparisons of CG and EG.

**Agility**

Agility of group volunteers in terms of 4*10 meters shuttle run has been presented in bellow sketched bar diagram in figure 4.

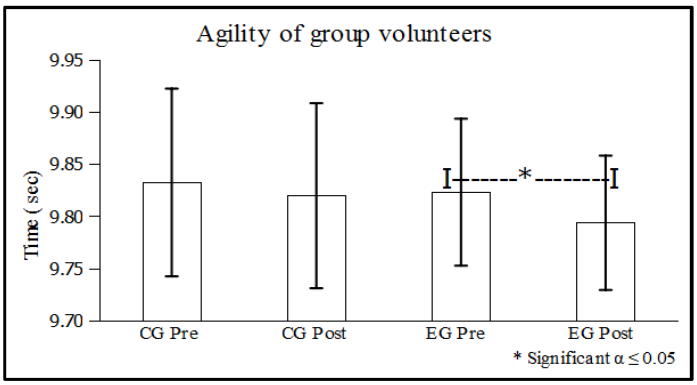


**Fig-4: Graphical representation of agility of group volunteers.**

A statistical significant difference has been observed in agility between pre and post-test of EG. The mean difference has been found 0.03 seconds lower than pre-test and ' p ' value has been found 0.002. No significant difference has been observed between the pre and post-test in CG but a decline mean value (0.01 sec lower than pre-test) has been observed in post-test.

**Cardiovascular Endurance ($\dot{V}O_2$ max)**

Predicted $\dot{V}O_2$ max of the cricketers has been measured through Queens college step test.

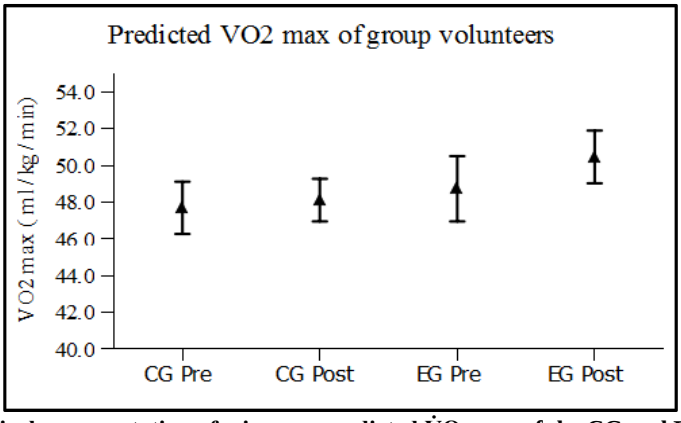


**Fig-5: Graphical representation of min-max predicted $\dot{V}O_2$ max of the CG and EG cricketers**

No significant difference has been observed in predicted $\dot{V}O_2$ max of group volunteers. Although an improvement in cardiovascular endurances has been observed in EG as well as CG group volunteers.

**Balance**

Whole body balance ability of the group volunteers has been tested through stork stand test. The obtained value from the test displayed in the figure 6.

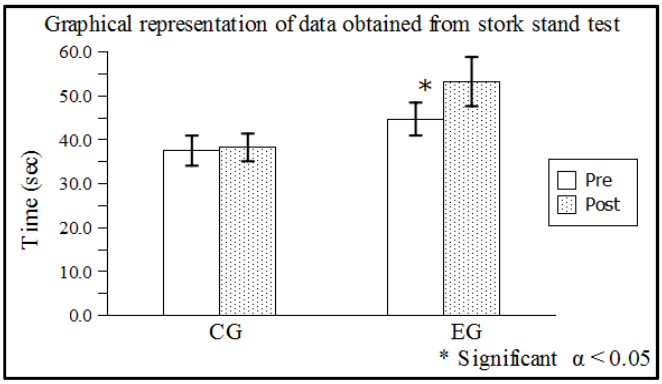


**Fig-6: Whole body balance ability of the cricketers before and after the experiment.**

A statistical significant improvement has been observed in paired samples t- test between pre and post-test of EG. In the comparison mean difference has been found 8.53 sec and 'p ' value has been found 0.03. No significant difference has been observed in CG, between the pre and post-test means at 0.05 level.

## DISCUSSION

According to the basic physical characteristics of the cricketers, both groups are merely similar. According to the recommendation of World Health Organization (WHO) Crickreters belonged from the normal range of BMI. The cricket specific motor fitness is also similar observed in pre-test data. That may come from same type of physical activity for a prolonged time. This similarity turns the cricketers into a homogeneous group. Low RHR of the cricketers denotes that they exercise frequently and are reasonably fit [5]. Low RHR may also be cause of abnormality of the heart which can be denied because all the volunteers go through ECG test and no abnormality has been found. The American Heart Association also suggests that long-term conditioning will lower the RHR. Yoga is a process of isometric contraction with controlled breathings; works on the muscles in a static position [4]. The mean RHR of both group cricketers during the pre-test was identical. RHR of CG and EG cricketers has been found lower than pre-test and a significant difference has been found in RHR of EG. Although, no significant differences has been observed in RHR, between post-test of CG and EG cricketers. From this point of view, it can be considered that daily physical training of CG lowers the RHR and yogic practices along with daily physical training of EG helps more to lowers RHR. Abdominal muscle endurance of EG cricketers slightly increased might be due to continuous practice of sun salutation, lolasana and chakrasana. This finding also supports the findings of Bhutkar et al. [8]. It is well known that sprinters are born, not made. Due to yogic practice, no transformation has been found in speed but an improvement has been found in agility. Singh et al. [9] investigated the effect of yoga training on the physical fitness of university level hockey players and found a significant difference in muscular strength, muscular endurance, flexibility and agility. Gourav [1] also found the same. Cricket is an intermittent nature endurance sports. A little improvement has been found in the predicted $\dot{V}O_{2\ max}$ of both groups but that was not up to the mark for EG volunteers to conclude some positive direction. While finding of Gopinath et al. [10] suggests that 12 weeks-controlled breathing of yogic practice improves $\dot{V}O2$ max significantly. Yogic practice significantly improves the balance ability of EG cricketers. Yogic asana, specially Sun salutation improves the balance ability of EG cricketers which is an important factor of performance in cricket. Polsgrove et al. [11] in their experimental study also found that yogasana significantly improves balance which enhances athletes' performance.

## CONCLUSIONS

The study concluded that short term yogic practice may significantly improve cricket specific motor fitness components specially muscle endurance, agility, balance. Bradycardia has been observed in cricketers. A little improvement in aerobic capacity has been observed among cricketers though the change was not enough to determine. The Control Group cricketers of the study not actually controlled by the researcher because they followed their daily training. Although the Experimental Group cricketers gone through the same training schedule after yogic practice. So, in that case statistically significant difference may be a misnomer because of the effect of daily physical training taxes on yogic practice. Four weeks of yogic practice is not good enough to determine any concrete decision. This study revealed that the inclusion of yogic practice in the training session of cricket may effect to improve motor fitness which enhances skill execution ability. Further studies are required to establish the right combination of repetition and duration of practice.

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