# A Study Of Effect Of Yogic Practices On Pulse Rate And Aerobic Capacity Of State Level Kho Kho Players

#### Mrs. Asha Narendra Kunder Physical Education and Yoga Teacher Queen Mary School, Mumbai

Dept.of Physical Education and Sports, Pratishthan Mahavidyalaya, Paithan, Dr.B.A.M. University, Chhatrapati Sambhaji Nagar, Maharashtra)

### ABSTRACT

The purpose of the study is to find out the effect of yogic practices on Physiological Variables like pulse rate and aerobic capacity of State Level Kho Kho players .To achieve the purpose of the present study 4 weeks pilot study was conducted on 13 state level Kho Kho players. They underwent a specific yogic exercise training program.For the Pre Test and Post Test ,the Pulse rate was measured with the help of pulse oximeter apparatus. To measure the Aerobic capacity /Vo2max , the Beep Test was conducted. Using the paired t-test for statistical analysis, the study examined changes in these physiological parameters over the course of the 4 weeks intervention. The results demonstrated significant improvements in both pulse rate and Vo2max / aerobic capacity indicating that sustained engagement in yogic practices can lead to substantial physiological benefits for the Kho Kho players.. These findings underscore the potential of yoga as a holistic approach to enhance athletic performance by optimizing physiological function.

Keywords : Yoga, Kho Kho, Pulse Rate, Beep Test, Aerobic Capacity, VO2max.

## Introduction

One of the fastest traditional Indian tag games, Kho Kho has shed the skin and is appearing in a new format to attract the masses. The game initially was played on the soil and is now being played on the mat. A lot of changes in the rules, new introductions are brought into the game to make it more popular. The Indian origin game has become Asian and even has spread worldwide resulting in Ist World Cup Kho Kho Championship . Now it should become a part of the Olympic Games in the years to come.

Now when Kho Kho is stepping towards the horizons of the International platform, this is the time for the coaches to include various scientific ways of training and coaching along with the traditional ways.

Kho Kho is a game of run and chase and it needs physical, physiological and psychological preparation for execution of skills. Kho Kho needs motor abilities like endurance, strength, flexibility, speed and reaction time in abundance. The charged situation and battle for supremacy will spell bound the audience and the game injects a rare experience and sense of satisfaction among the spectators. (H.V.Nataraj, 2017)

# Yoga

Yoga, an Indian traditional science, is becoming popular all over the world due to its scientific approach. Research studies in the field of yoga clearly show positive results of practicing yoga exercises on physical, mental, emotional, social and spiritual level.

Yogic exercises are psycho-physiological in nature. The nature of Asanas and Pranayamas is different from the physical exercises and so also the response of the body.

Asanas are certain patterns of postures that stabilize the mind and the body.

Pranayamas are the practices in the control of respiratory impulses.

# Kho Kho

The game of kho kho needs a high level of physical and mental fitness. Repeated sitting and getting up from the square by the chaser develops strength and endurance of the legs and the back (lower extremity), explosive power and reaction ability. Similarly, a defender has to repeatedly change the path of his defense by performing a zig-zag path of runs, curved movements which calls for agility and balance. Defending against an attacker and to survive for longer duration for 3-4 minutes by performing different difficult movements demands high level short and medium duration endurance combined with agility. The ability to push beyond his limit while defending in spite of fatigue develops will power. Above all suppleness of the body, quick judgment, intelligence, presence of mind, and anticipation is developed to the core. (H.V.Nataraj, 2017)

Hence the researcher plans to study the effect of yogic practises on motor fitness as well as Physiological Variables of State Level Kho-Kho players by conducting a study

titled;

### "A Study of Effect of Yogic Practices on Selected Motor fitness and Physiological Variables of State Level Kho Kho Players."

## **Objectives /Study purpose**

The present study aims at collecting the scientific evidence about the effects of selected yogic practices on physiological variables like pulse rate and Vo2max of state level Kho Kho players. Hence the objectives of the study are .....

- To observe the effect of selected yogic practices on pulse rate of state level kho kho players.
- To observe the effect of selected yogic practices on aerobic capacity or Vo2max of state level kho kho players.
- To compare the scores of pre test and post test after yogic training .

## 1.5 Hypothesis

Depending upon the reviews of literature, research findings and researcher's understanding of the problem and personal experience, it is hypothesised that-

 $H0_1$  There would be a significant difference in resting pulse rate of Kho Kho players.

H0, There would be significant improvement in aerobic capacity of Kho Kho players.

## Design/ Method of the Study

The researcher chose an experimental method for conducting this Pilot study. This study consists of one control group and one experimental group of 13 players each. Only the experimental group received the specific Yoga training for the period of 4 weeks.

Pre Test and Post-test was organised before and after the experimental period of 4 weeks.

### The Subjects / Sampling

A total number of 13 State level male Kho Kho players of age group 15 to 19 years from Mumbai were selected for this study. After the selection of the samples, all the necessary instructions were given to them about the objective of the study and the test procedure in the presence of their coaches to elicit active cooperation from the players. The 13 State level players will be pooled as sample from the population of hundreds of state level players by using purposive sampling method.

#### **Selection of Variables and Tests**

After going through the related literature the following dependent and independent variables are selected to collect the data at the pre-test and post-test and to render the training in between.

#### **1** Dependent Variables

Variables	factors measured
Pulse rate	Heart functioning
Aerobic Capacity	Maximal oxygen uptake

#### 2 Independent Variables

A set of 15 yogic practices are chosen by the researcher for this study as independent variables on the basis of the fact that they are beneficial as they promote physical fitness required for sports.

1) Omkar	2) Yog mudra	3) Ushtrasan	4) Paschimottanasan
5) Bhujangasan	6) Shalabhasan	7) Sarvangasan	8) Utkatasan
9) Vrikshasan	10) Veerbhadrasan	11) Natarajasan	12)Anuloma Viloma
13) Bhramari	14) Kapalbhati	15) Shavasan	

## **Criterion Measures**

- 1. Pulse Rate Measured using the Pulse Oximeter with results recorded in count per minute.
- 2. Aerobic Capacity / VO2 Max- evaluated using the Beep test, with results reported in meters and then calculating Vo2max %.

## **Statistical Procedure**

The data of pre and post tests of all the selected subjects is analyzed by using the descriptive statistics with the help of SPSS.

#### **Analysis & Interpretation of Results**

	Pulse rate of Pre test of Experimental Group	Pulse rate of Post test of Experimental Group	Vo2max_ Pre_Ex	Vo2max_ Post_Ex
Mean	79.77	74.69	41.33	49.08
Median	81.00	73.00	40.50	49.50
Mode	81	85	40.2	48.6
Std. Deviation	11.41	9.22	3.82	3.97
Skewness	23	75	.08	36

Table No 1 : Descriptive Statistics of physiological Variables of Experimental Group

The provided data compares multiple performance indicators before and after an exercise regimen. These indicators include **Pulse Rate (PR)** and **VO2max.** 

#### 1. Pulse Rate (PR):

- **Pre Yogic Training :** The mean pulse rate is 79.77 (SD + 11.41) bpm, with the median at 81 (SD + 9.22) bpm, suggesting a moderate and typical resting heart rate before exercise.
- **Post Yogic Training :** The mean pulse rate decreases to 74.69 bpm, while the median decreases slightly more to 73 bpm. This reduction in heart rate is indicative of cardiovascular improvement and recovery Post Yogic Training. A decrease in pulse rate Post Yogic Training generally suggests better heart efficiency and fitness over time.

#### **2.** VO2max:

- **Pre Yogic Training :** The mean VO2max is 41.33 (SD + 3.82), with a median of 40.5, representing a baseline for aerobic fitness.
- **Post Yogic Training :** There is a significant increase in VO2max, with the mean reaching 49.08 and the median at 49.5 (SD + 3.97). This improvement suggests that the exercise regimen effectively enhanced the participants' cardiovascular fitness, as VO2max is a key measure of the body's ability to use oxygen during intense physical activity.

The data clearly shows beneficial effects of exercise across various measures. **VO2max** scores improve significantly Post Yogic Training, indicating enhanced aerobic capacity and endurance.

Though the changes in **Pulse Rate** are modest, they still indicate favourable adaptations and improved cardiovascular efficiency. The data exhibits low variability for most measures, indicating consistent responses to the exercise program across participants. Overall, the yogic training program appears to have had a positive effect on physiological fitness, as reflected in improved endurance, cardiovascular capacity and aerobic capacity.

	Mean	N	Std. Deviation	Std. Error Mean
Pulse rate of Pre test of Experimental Group	79.77	13	11.410	3.165
Pulse rate of Post test of Experimental Group	74.69	13	9.223	2.558

 Table No 2 : Descriptive Statistics of Pulse Rate Variable of Experimental Group

The mean Pulse rate of Pre test of Experimental Group (79.77) is higher than the mean of Pulse rate of Post test of Experimental Group (74.69), suggesting that, on average, the scores increased from pre- to Post Yogic Training. Both Pulse rate of Pre test of Experimental Group and Pulse rate of Post test of Experimental Group have not much different standard deviations (around + 11.410 for pre and + 9.223 for post). This indicates that the spread of values around the mean is relatively consistent between the two conditions.

The descriptive statistics show that the Post Yogic Training scores tend to belower than the Pre Yogic Training scores, with a moderate degree of variability in both cases. The slightly lower standard error for the Post Yogic Training scores indicates slightly more variability in the sample means for the Post Yogic Training condition.

**Table No 3 :** Correlation of Pre and Post test Pulse Rate Variable of ExperimentalGroup

	Ν	Correlation	Sig.
Pulse rate of Pre-test of Experimental Group & Pulse rate of Post test of Experimental Group	13	.581	.038

A correlation of 0.581 indicates a moderate positive relationship between Pulse rate of Pre test of Experimental Group and Pulse rate of Post test of Experimental Group. This means that as the Pulse rate of Pre test of Experimental Group values increases, Pulse rate of Post test of Experimental Group values tend to also increase, though the relationship is not extremely strong.

The p-value of 0.038 is less than the commonly used significance threshold of 0.05. This indicates that the correlation is statistically significant, meaning the relationship between Pulse rate of Pre test of Experimental Group and Pulse rate of Post test of Experimental Group is unlikely to have occurred by chance.

There is a moderate positive correlation between Pulse rate of Pre test of Experimental Group and Pulse rate of Post test of Experimental Group, and this correlation is statistically significant. This suggests that higher Pre Yogic Training scores are associated with higher Post Yogic Training scores, and this relationship is not due to random variation in the data.

**Table No 4 :** Analysis of Paired sample T test of Pre and Post test Pulse Rate Variableof Experimental Group

		Paired Differences			t	df	Sig. (2-tailed)
		Mean	Std. Deviation	Std. Error Mean			
Pair 1	Pulse rate of Pre test and Post test of Experimental Group	5.077	9.648	2.676	1.897	12	.082

Although there is a positive difference in the pulse rate before and after exercise (mean difference of 5.077 bpm), the result is not statistically significant based on the t-test (p-value = 0.082). This suggests that the observed difference could be due to random variation, and there is no difference in pulse rates pre- and Post Yogic Training.

	Mean	N	Std. Deviation	Std. Error Mean
VO2 Max of Pre test of Experimental Group	41.338	13	3.8294	1.0621
VO2 Max of Post test of Experimental Group	49.085	13	3.9789	1.1035

#### Table No 5 : Descriptive Statistics of VO2 Max Variable of Experimental Group

There is a noticeable increase in the mean VO2 Max from the pre-test (41.338) to the post-test (49.085), which suggests an improvement in the fitness level of the experimental group.

The similar standard deviations and standard errors for both pre-test and post-test indicate that the spread of the data points around the mean is relatively consistent, which adds to the reliability of the observed improvement.

**Table No 6 :** Correlation of Pre and Post test VO2 Max Variable of ExperimentalGroup

	N	Correlation	Sig.
VO2 Max of Pre-test of Experimental Group & VO2 Max of Post test of Experimental Group	13	.559	.047

The moderate positive correlation (0.559) and the statistically significant p-value (0.047) indicate that there is a meaningful relationship between the VO2 Max values from the pre-test to the post-test. In practical terms, this suggests that changes in VO2 Max from pre-test to post-test are related and that the relationship is not due to random variation.

**Table No7 :** Analysis of Paired sample T test of Pre and Post test VO2 Max Variableof Experimental Group

	Paired Differences			t	df	Sig. (2-tailed)
	Mean	Std.Std. ErrorDeviationMean				
VO2 Max of Pre- test and Post test of Experimental Group	-7.7462	3.6671	1.0171	-7.616	12	.000

The mean difference of -7.7462 indicates that the VO2 Max scores in the post-test are significantly higher than in the pre-test, suggesting an improvement in cardiovascular fitness after the intervention.

The t-statistic and p-value (0.000) show that this improvement is statistically significant, meaning the intervention likely had a meaningful effect on improving the participants' VO2 Max.

Given the large t-value and the low p-value, we can confidently conclude that the intervention had a significant positive impact on the experimental group's VO2 Max. The paired samples t-test shows a statistically significant improvement in the VO2 Max scores of the experimental group from pre-test to post-test, with an average improvement of 7.75.

## Conclusion

The preliminary study of Yogic practices incorporating Omkar ,Asanas, Pranayam and Kapalbhati has been significantly effective in enhancing the physiological measures, like VO2 Max/ aerobic capacity and pulse rate of state level kho kho players.

This study suggests that the regular practice of yoga as part of or alongwith the traditional training/coaching methods enhances the components of fitness that are the essential components of sports performance.

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