

COMPARATIVE EFFECT OF YOGA AND KHO-KHO GAME  
ON SELECTED PHYSIOLOGICAL VARIABLES OF  
INTER - COLLEGE FEMALE ATHLETES



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**Abstract:**

Yoga & Kho-Kho games are Indigenous activity in India, Yoga has been accepted by human Society for its innate values towards the improvement in human health & Kho-Kho game is also originated of India which has traditional importance especially in Maharashtra. Yoga and Kho-Kho games mostly aerobic and anaerobic types of activities which are more impact on various physiological systems in the human body.

The study was designed to investigate the comparative effect of Yoga and Kho-Kho game on selected physiological variable of Inter-College Players, under the affiliated to Manipur University. To achieve the purpose of Females were selected from various colleges under the affiliated to Manipur University as subjects they were divided into three groups i.e. Two experimental group and control group. There was not given any specific training for control group. Experimental Group A was assigned Yoga training and Experimental Group B was assigned Kho-Kho training for 12 weeks criterion variables was Blood pressure, Respiratory rate, Heart rate, Vo<sub>2</sub> max. All the dependent variable were assessed before and after training period of 12 week as pre test and post test. Analysis of covariance was assists to find out the post test mean different among the treatment groups. Experimental Group A showed significant superiority over the Experimental Group B in reducing systolic blood pressure (  $D=0.42$ ,  $P<0.05$  ), Experimental Group A showed significant superiority over the Experimental Group B in reducing respiratory rate  $C.D.=0.18$ ,  $P<0.05$  , Experimental Group A showed significant superiority over the Experimental Group B reduce pulse rate  $C.D.=0.40$ ,  $P<0.05$ , Experimental Group B showed significant superiority over the Experimental Group A in improving vo<sub>2</sub> max  $C.D.=0.45$ ,  $P<0.5$ .

**Keywords:** Yoga, Kho-Kho & Physiological Variables.

**Introduction:**

Yoga is a traditional science, is becoming very popular all over the world day by day due to its scientific research. The credit for such popularity of yoga goes to Swami Kuvalayanand who is considered as the father of scientific yoga. Yoga exercises with their varied typed helps to

stabilize and balance the internal system of the body, thereby bringing about general physical fitness and physiological homeostasis.

Kho-Kho ranks as one of the most popular traditional sports in India. The origin of Kho-Kho is difficult to trace, but many historians believe, that it is a modified form of 'Run Chase', which in its simplest form involves chasing and touching a person. With its origins in Maharashtra, Kho-Kho in ancient times, was played on 'raths' or chariots, and was known as RATHERA.

Like all Indian games, it is simple, inexpensive and enjoyable. It does, however, demand physical fitness, strength, speed and stamina, and a certain amount of ability. Dodging, feinting and bursts of controlled speed make this game quite thrilling.

High level of physical fitness performance is the result of a multiple factors such as physical, motor abilities, constitutional mental abilities, high physiological work output, technical and tactical efficiency etc. The performance of excellent yoga and Kho-Kho players is the result of interactions of a number of these factors, which includes high physiological demands. Therefore, yoga and Kho-Kho are a game of physio-physical activity. It has both physical and physiological variables besides psychological, social and technical aspects. In this modern era of competitions the physical and physiological fitness of players are as important as training the different skills of the game on the scientific lines. These players are prepared not only to play the game, but also to win the game, and for winning the game, it is not only the proficiency in the skills, which brings victory, but more important is the physiological prowess of the players.

In the modern sports world, physiological variables have become one of the most important aspects of sports sciences that deal with the improvement of sports performance. The game of yoga and Kho-Kho needs high level of physio-physical balance, which absolutely controls the mental, physical, motor-coordinative activities and physiological work outputs under high intensive conditions. It is a game of continuous action with mental pressure requiring continuous adaptation to the changing situations by the team as well as the individual players.

#### **Materials and Method:**

The investigator has used a parallel group method of true experimental design that consists of one control group and two experimental groups.

#### **Subject:**

The investigation was carried out in the Inter-College Female Athletes from various colleges affiliated to Manipur University (n=90), aged 18 to 24 years, as selected from the population two hundred females athletes of the said various colleges affiliated to Manipur University, were randomly assigned in to three groups viz., Exp.Gr. A (Yoga), Exp. Gr. B (Kho-Kho) and Control. Each group consists of 30 students. As per Inter - College health record, all the students were found clinically normal.

After the pre-test with the physiological test the Exp. Gr. A underwent a training programme of selected Yoga practices and Exp. Gr. B received a training programme of selected Kho-Kho Practices, whereas the Control group did not participate in any of the above training programme. Yoga training programme to the subjects of the Exp.Gr. A has been imparted daily for 60 minutes in the morning and Kho-Kho training to Exp. Gr. B for 60 minutes in the evening on the same day. All these training programmes were imparted six days in a week except Sunday and holidays for a total period of 12 weeks (three months).

The subjects of the control group neither participated in yoga nor in Kho-Kho practices.

After the experimental period is over, the subjects of all the groups were post-tested with the physiological Tests.

1) Dependent variable

- **Physiological Variables:** Since both yoga and Kho-Kho game are mostly aerobic and anaerobic types of nature, they have more impact on various physiological systems. Further, aerobic and anaerobic activities influence one's circulatory process that, in fact, changes respiratory rate, heart rate and  $VO_2$  max. Thus, selection of following dependent variables seems to be justified:

1. Blood pressure (systolic and diastolic blood pressure),
2. Respiratory rate,
3. Heart Rate, and
4.  $VO_2$  Max test.

2) Independent Variables: A set of selected Yoga exercises for Experimental Group A and set of selected Kho-Kho game for Experimental Group B were considered as the independent variables for this study.

#### **Data Analysis:**

The data collected were analyzed primarily by the descriptive statistics. Further, looking towards the nature of design of the present study, ANCOVA followed by Scheffe's post hoc test were applied for data analysis.

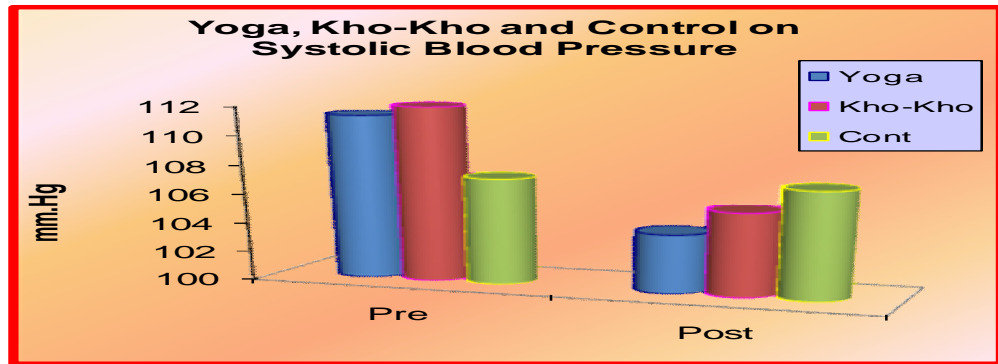
#### **Results:**

##### **Result on Systolic Blood Pressure:**

- Yoga training showed significant reduction in systolic blood pressure which is remained at the lower limit of normal range ( $CD=0.68$ ,  $p<0.01$ ).
- Kho-Kho training also helped to reduce systolic blood pressure which remained at the higher limit of normal range ( $CD=0.46$ ,  $p<0.05$ ).
- Controlled subjects did not show any change in systolic blood pressure scores ( $CD=0.12$ ,  $p>0.05$ ).

- Yoga group showed significant superiority over the Kho-Kho game group in reducing systolic blood pressure (CD=0.42,  $p < 0.05$ ) (Graph No.1).

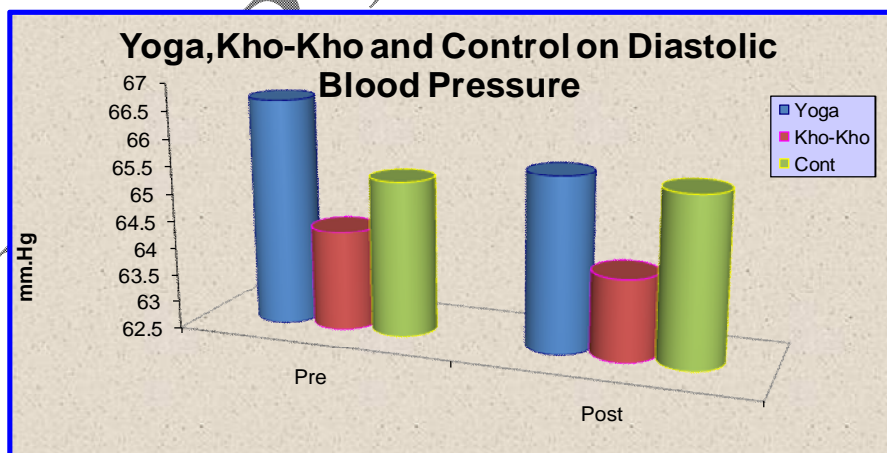
**Graph No.1**



**Result on Diastolic Blood Pressure:**

- Yoga training did not show any change in diastolic blood pressure which in fact remained at the normal range (CD=0.08,  $p > 0.05$ ).
- Kho-Kho training also showed similar result like yoga training on diastolic blood pressure which in fact remained unchanged (CD=0.14,  $p > 0.05$ ).
- For controlled subjects the scores of diastolic blood pressure were unaffected (CD=0.10,  $p > 0.05$ ).
- Thus, the selected training interventions did not show any significant change in diastolic blood pressure (CD=0.12,  $p > 0.05$ ) (Graph No.2).

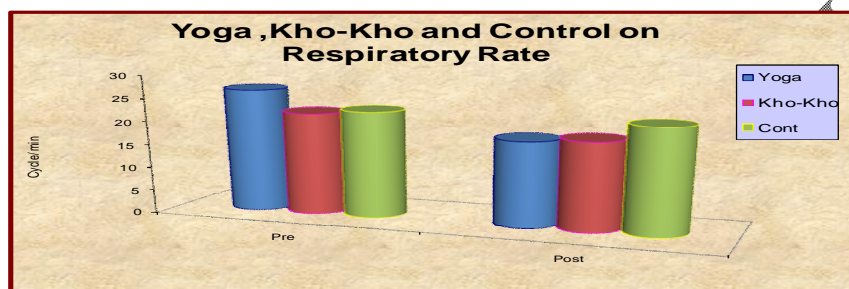
**Graph No. 2**



### Result on Respiratory Rate:

- Yoga training showed significant reduction in respiratory rate which is remained below the normal range (CD=0.78,  $p < 0.01$ ).
- Kho-Kho training also helped to reduce respiratory rate which remained at the higher limit of normal range (CD=0.49,  $p < 0.05$ ).
- Controlled subjects did not show any change in respiratory rate scores (CD=0.10,  $p > 0.05$ ).
- Yoga group showed significant superiority over the Kho-Kho game group in reducing respiratory rate (CD=0.18,  $p < 0.05$ ) (Graph No. 3).

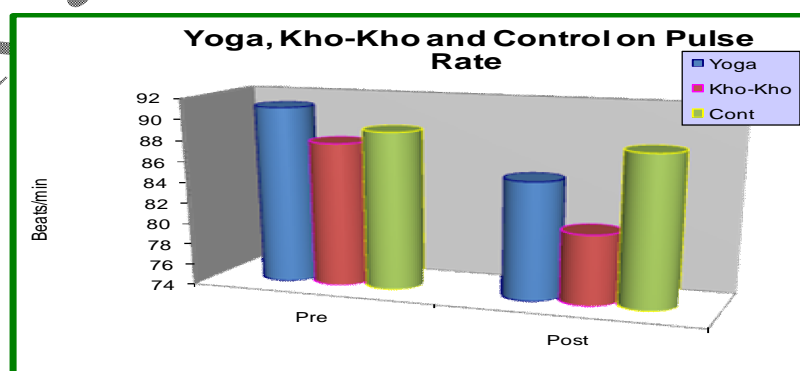
Graph No.3



### Result on Pulse Rate:

- Yoga training showed significant reduction in pulse rate which is remained at the lower limit of the normal range (CD=0.61,  $p < 0.01$ ).
- Kho-Kho training also helped to reduce pulse rate which also remained within normal range (CD=0.52,  $p < 0.01$ ).
- Controlled subjects did not show any change in pulse rate (CD=0.15,  $p > 0.05$ ).
- Yoga group showed significant superiority over the Kho-Kho game group in reducing pulse rate (CD=0.40,  $p < 0.05$ ) (Graph No. 4).

Graph No. 4

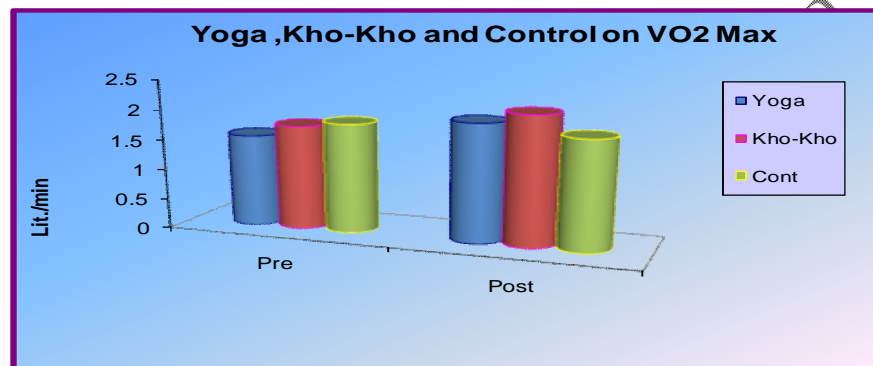




### Result on VO2:

- Yoga training showed significant improvement in VO2 max (CD=0.56,  $p<0.01$ ).
- Kho-Kho training also helped to improved VO2 max (CD=0.67,  $p<0.01$ ).
- Controlled subjects did not show any change in VO2 max (CD=0.13,  $p>0.05$ ).
- Kho-Kho group showed significant superiority over the Yoga group in improving VO2 max (CD=0.45,  $p<0.05$ ) (Graph No. 5).

**Graph No.5**



### Findings:

Analysis of physiological variables revealed that:-

- Yoga group showed significant superiority over the Kho-Kho game group in reducing systolic blood pressure (CD=0.42,  $p<0.05$ ).
- The selected training interventions did not show any significant change in diastolic blood pressure (CD=0.12,  $p>0.05$ ).
- Yoga group showed significant superiority over the Kho-Kho game group in reducing respiratory rate (CD=0.18,  $p<0.05$ ).
- Yoga group showed significant superiority over the Kho-Kho game group in reducing pulse rate (CD=0.40,  $p<0.05$ ).
- Kho-Kho group showed significant superiority over the Yoga group in improving VO2 max (CD=0.45,  $p<0.05$ ).

### Conclusion:

Yoga reduces systolic blood pressure, respiratory rate and pulse rate than Kho-Kho game, whereas no change is recorded in diastolic blood pressure by both the interventions. It is interesting to note that Kho-Kho training increases VO2 max better than Yoga. This indicates both Yoga and Kho-Kho are very good to improve circulo-respiratory efficiency of the Inter-College female athletes among the various colleges under the affiliated to Manipur University. Thus, both Yoga and Kho-Kho game activities are complimentary to each other to improve

almost all the selected physiological variables in Inter-College female athletes among the various colleges under the affiliated to Manipur University. Yoga also records better impact for synthesizing the controlled physiological functions. Kho-Kho game activities are also recommended in schools for improving physiological function.

**References:**

- Adrian, M.J. (1981). Flexibility in aging adult. In E.L. Smith and R.C. Serfass, (Eds.), Exercise and aging: The scientific basis. N.J.: Ensolow Hillside.
- American Academy of Paediatrics Committees on Sports Medicine and School Health. (1987). Physical fitness and the schools. Paediatrics, 80, 449-450.
- American Alliance for Health, Physical Education, Recreation and Dance. (1984). Technical Manual: Health related physical fitness. Reston , V.A. : AAHPERD.
- American College of Sports Medicine. (1988). Physical fitness in children and youth. Medicine and Science in Sports and Exercise, 20, 422-423.
- Anand, B.K. (1993). Yoga and medical sciences. Ind. J. Physiol. Pharmacol., 35, 84.
- Baumbartner, T.A., and Jackson, A.S. (1982). Measurement for evaluation in physical education (2<sup>nd</sup> ed.). Boston: Houghton Mifflin.
- Buxton, D. (1957). Extension of the Kraus-Weber test. Research Quarterly, 28, 210-217.
- Chakrabarti, B.K., Ghosh, H.N. and Sahana, S.N. (1972). Modern human physiology. Calcutta : The New Book Stall.