



A STUDY OF EFFECT OF EXERCISE AND YOGA ON PHYSICAL & MENTAL FITNESS ON HANDBALL PLAYERS

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ABSTRACT

The purpose of the study to show the effects of exercise and yoga on physical and mental fitness on handball players. In this study, 70 handball players were selected randomly from different collages of Rajasthan. Ages of the subject's players should be around 18 to 21 years. These are then divided into three groups: Group I (yogic practices) and Group II (physical exercise) and Group III is control group. These experiments were done for 12 weeks. Control group only do their regular works. Pilot study was done for capacity of the players for fix their load. Physiological, physical and psychological variables are also used. Standardized tests and questionnaire methods were used to collect data on all the selected variables. 't' test is used for statistical analysis and also to find out significant improvement. 0.05 level of confidence is fixed. Heart rate increases due to yogic exercises. Yoga and exercises can increase flexibility, power, cardio-respiratory endurance, blood pressures, resting heart rate and breathing holding time of handball players.

KEYWORDS: - yoga and exercise, flexibility, cardio-respiratory endurance, resting heart rate and breathing holding time

INTRODUCTIONS

Yoga is been originated from the Sanskrit word. It means the suppression of all activity of body, minds and make them in order for distinction and liberations.¹ Yoga is science and a theory. It can use in therapeutics purpose. It is a *moksha shastra*, *moksha* means freedom and *shastra* means teaching. It can be also mean to yoke, unite or bring together.^{2,3} It is also help to restore the harmony in the body-mind complex. Yoga did not represent any religion, creed or race. It teaches sprung from the spiritual soil of ancient India and called as *sanatana dharm*.^{4,5}

In Yoga sutras, yoga is been practiced approximately from 2nd century. Patanjali has also some existing practices and writings text. It also contains some essential idea of yoga theory and practices. These systems are external because it has a relationship with body, breath and senses. Also, essence of yoga in eight division or ashtanga yoga it can comprise the stage of concentration by increases three of eight limbs.^{6,7,8}

Patanjali messages that every human being is been fit and naturally balanced. Yoga is one the most important aligning of inner balance. In yoga practices, many levels of human experience like body, breath and mind are given full attention and freed for more concentration and reflections.^{9,10,11}

In modern time, yoga is used to remain healthy. Patanjali has given two way to remain healthy is-

1. To remain healthy, removes that obstacles which block your path

2. To promoting the healing forces^{12,13}

For self-management these two points are most important. Illustrations of Patanjali shows that in earlier times yoga practices are embodied for integrated approach. It helps to improve the health and spiritual self-understanding.^{14,15} Training and practices of yoga is been exists around five thousand years or more. Yoga is derived from a word *yuj*, means unite and join together. Yoga can be used for the transformation of person from their natural form to healthy form. Yogic vision development by sound and clear methodology which helps to brings a luminous, perceptive and a truth thing.^{16,17}

PHYSICAL ASPECTS OF YOGA

In modern era, yoga and exercises can be a game changer. Physical molding and cantered fixation both are the striking component of yoga. Daily yogic practise makes the person healthy and physical wellness.^{18,19} Yoga asanas gives the development of spine, for control breath, focus on daily schedules. Due to muscular and physical stress, body imbalance is occurring which may lead to different aches and pains. Asana is done by smooth, control movement to provide the maximum stretch to body.^{20,21}



PHYSIOLOGICAL ASPECTS OF YOGA

Yoga helps to improve the legitimate working of the body. Yoga nourishes the endocrine gland which is useful for development and advancement.²² It has been proved that yoga can increase the capacity of processing and breathing. It helps to blood flow to the mind and improve the mental health. Yoga can improve muscle strands and nerves for physiological work. Legitimate can be improve the joints, breath and blood pressure.^{23,24,25}

BENEFITS OF YOGA EXERCISE

In 21st century, everyone needs to be fit. Everyone need to be fit and well-being. Yoga and exercise make human beings stronger and healthier. Some benefits of yoga and exercises are-^{26,27,28}

1. Decreases stress

Yoga is most important to decreases the stress level. It can reduce the level of cortisol hormones which are responsible for stress.

2. Anxiety

Yoga practices reduces the anxiety level.

3. Reduces inflammations

Some studies show that daily practise of yoga may help to reduces the body inflammation. Inflammation is a chronic disorder it can develop pro-inflammatory diseases like heart disease, cancer, diabetes.

4. Improve heart health

Heart supply the blood to whole body. it can also supply nutrition to the heart and it make the body healthy. Some studies show that yoga may help to reduces the several risk of heart diseases.

5. Depression

Daily practices of yoga have anti-depressant activity and help to decreases the symptoms of depressant. Yoga helps to lower the cortisol level, serotonin level and the neurotransmitter associated to depression.^{29,30}

6. Chronic pain reduction

Chronic pain affects millions of peoples. Research demonstration that yoga may reduce many types of chronic pain.

7. Sleep quality

Poor sleep may increase the risk of depression, high blood pressure etc. yoga practises may help to improve sleep.

8. Improve flexibility, balance and breathing problem

Daily practises of yoga may help to reduces the breathing problems and maintain the body balance. It may help to improve cardiovascular diseases. Some yoga practises may help to improve flexible body.^{31,32}

YOGA IMPROVES HEALTH

1. Improves your flexibility

Flexibility is the first and most beneficial of yoga. Normal person cannot touch his feet's but continuous practices of yoga can help them. Continuous using of yoga can remove or decreases the pain and aches.

2. Muscle strength

Strong muscle help to protect us from arthritis, back pain etc. strength is made up by yoga.

3. Protect your spine

Crave movement help the spine to take their nutrition. Some asana practices may keep this disk supple.

4. Blood flow

Yoga helps to increases the blood flow in the body. it helps to circulate the blood specially hands and feet. Yoga boots the haemoglobin and red blood cells level; it carries oxygen to cells and helps to increases the blood flow in heart and may reduce the swelling in kidney or heart problems. Blood clot is responsible for heart attack and strokes, yoga may help to remove or dilute theses clots and make person healthy.^{33,34}

5. Focusing

Now a day, focus is much more important then everything. For any kind of work focus is important. Yoga helps to improve your focus, reaction time, memory and IQ.³⁵

6. Improve system and balance

Yoga can encourages relax, slow your breath, focus and sift the balance the sympathetic nervous system. This improve the blood flow to intestine and reproductive organs, decreases the blood pressures. Regular practices of yoga exercise improve body balance. It removes or decreases the back pain, knee pains and other body problem.^{36,37}

7. Immune system

Yoga (asana and pranayama) can improve or boost the immune system. Meditation is the important way of boosting immune system.

8. IBS and other digestive problems

Now a day, everyone suffers with many kinds of diseases or problems. Some are ulcer, irritable bowl syndromes and constipations. Some yoga practices may help to improve the constipation problems and also lower the risk of colon cancers. In physical practises body can move which help in digestion and removes the waste product from the body.^{38,39,40}

METHODOLOGY

Research needs a systematic method and procedure like research design, source of data, sampling method, selection of subjects, collection of data, criterion Measures etc. some reliable and authentic data makes research successful. The statistical analysis of data provides a complete and successful hypothesis as pre-selected by the researcher.



SOURCES OF DATA

Data has pertaining the study of appropriate test on inter-collages of Rajasthan state. Players are participating in inter-collages tournaments which held in Rajasthan collages.

SELECTION OF THE SUBJECT

In this study, 70 handball players were selected randomly from different collages of Rajasthan. Ages of the subject's players should be around 18 to 21 years.

DESIGN OF THE STUDY AND VARIABLES

There are two types of variables-

- I. Independent Variables- yogic practices and physical exercise.
- II. Dependent Variables-
 - A. Physical variables-
 - Flexibility
 - Explosive power
 - Cardio-respiratory
 - B. Physiological variables
 - Blood pressure
 - Resting heart rate
 - Breath holding time
 - C. Psychological variables
 - Anxiety
 - Stress
 - Aggression

SELECTION OF TESTS

Present study was done to assess the effect of yogic practice and physical exercise of handball players. It may include the physiological, physical and psychological variables. Standardized tests and questionnaire methods were used to collect data on all the selected variables.

1. FLEXIBILITY

Purpose:

Flexibility test helps to measure the flexibility of the lower back muscles and the hip.

Equipment used: Sit and Reach Box

Procedure:

In sitting position, legs together, knees flat on the floor, and feet flat against the box, shoulder width apart. Bend forward at the waist and reach as far forward as possible with the fingers. Measuring the number of centimetres one can reach either in front of or beyond the vertical surface. Four trials were done on subjects and best one will be used for test score.

Results: -

1. Mean and dependent 't' test value were used.

	Yogic practices group	Physical exercise group	Control group
Pre test	17.35	16.25	17.6
Post test	17.75	18.95	17.6
't' test	9.35	11.17	0.38

Significant at 0.05 level.

Physical variable

S.no	Variables	Test item
1	Flexibility	Sit and reach box
2	Explosive power	Standing board jumping
3	Cardio-respiratory endurance	15-minute copper test

Physiological variable

S.no	Variables	Test item
1	Blood pressure	Sphygmomanometer
2	Resting heart rate	Stop watch
3	Breathing holding time	Stop watch

Psychological variable

S.no	Variable	Test item
1	Anxiety	SCAT inventory
2	Stress	Inventory
3	Aggression	Inventory

EXPERIMENTAL DESIGN AND STATISTICAL PROCEDURE

In this study, seventy handball players are been selected randomly. Players which are selected is known as subjects and then divided into two experimental group. Group 1 is for yogic practices and group 2 is for physical exercise. It can be done for twelve weeks of five day per week. Variables are divided into physical, physiological and psychological. These variables are assessed by standardized test. Pre and post test data were collected immediately after twelve weeks of training. These data were analysed by dependent 't' test and by ANCOVA co-variances. For post-test F-ratio were found to be significant and the sheffee's post hoc test was used. In all the cases 0.05 levels was fixed as level of confidence to test the hypotheses.



Table shows that the dependent 't' ratio value of pre and post-test of flexibility on yogic practices, physical exercise and controlled group are 9.35, 11.17 and 0.38. significant value required with df 19 at 0.05 level. Table value is less than the obtained 't' ratio value. It is been prove that the performance of flexibility is improved by training. Control group is not improved as the 't' value is less than the table value. These are not part of any training.

2. Co-variance of flexibility analysed

Yogic practices group	Physical exercise group	Control group
19.45	19.79	17.18

Source of variance	Sum of square	Df	Mean square	'F' ration
Within	72.40	57	1.30	30.12
Between	77.86	2	38.94	30.12

Significant at 0.05 level.

This show the post-test value of yogic practices, physical exercises and control groups are 19.45 19.79 and 17.18, F ratio is greater than table value with df 57 and 2. This result shows that there is some significance difference in post-test means of yogic practices, physical exercises and control group on Flexibility. Scheffe's post hoc test were applied to find out the significant differences.

3. Scheffe's test for the pre and post paired means of flexibility

Yogic practice group	Physical exercise group	Control group	Mean difference	Confidence interval
19.45	19.75	17.18	0.36	0.10
19.47	19.77	17.18	2.25	0.10
19.50	19.76	17.18	2.60	0.10

Significant at 0.05 level.

It shows the post-test differences on Flexibility between the yogic practices group and physical exercises group were 0.36 are lesser than the confidence interval value 0.10, which shows no significant difference at 0.05 level of confidence. Yogic practices group and control group; physical exercises group and control group were 2.25 and 2.60. These values are greater than the confidence interval value 0.10. Results show that there is no difference in flexibility between the post-test of yogic exercise, physical exercise. This study shows that physical exercise is better than yogic practices and control group for improvement of flexibility.

2. EXPLOSIVE POWER

Purpose:

To measure the explosive power in horizontal distance.

Equipment:

Measuring tape and Chunam.

Procedure:

A line is drawn on the ground. Players takes a position with toes just behind the line and feet slightly apart. Taking off from both feet simultaneously then jumps as far as possible and landing on both feet. In jumping, players crouch slightly and swings the arms to aid the jump. distance to the nearest centimetre from take-off line to the closest heel position. 3 trails are recorded.

Results-

1. Mean and dependent 't' test values were analysed

	Yogic practices group	Physical exercise group	Control group
Pre test	1.94	1.99	1.9
Post test	2.05	2.17	1.91
't' test	7.80	8.3	0.44

Significant at 0.05 level

For pre and post-test, the dependent 't' ratio of yogic practices, physical exercise and control group are 7.74, 8.3 and 0.44. table value required for significant difference with df 19 at 0.05 level. 't' ratio value is greater than table value. Training improved the performance of Explosive power.

**2. Analysis of Co-variance on explosive power**

Yogic practices group	Physical exercise group	Control group
2.06	2.15	1.95

Source of variance	Sum of squares	Df	Mean square	'F' ratio
Within	0.4	56	0.03	36.53
Between	0.40	2	0.20	36.52

Significant at 0.05 level of confidence

Table show that the post-test values of yogic practices, physical exercises and control groups are 2.06, 2.15 and 1.95. F-ratio is 36.53. it is greater than the table value of 3.16 with df 2 and 56 required for significance at 0.05. This study shows there was a significant difference in post-test means of yogic practices, physical exercises and control groups on Explosive power. Scheffe's post hoc test is used to find out the mean significant differences.

3. Scheffes test for post-test paired means of explosive power

Yogic practice group	Physical exercise group	Control group	Mean differences	Confidence interval
2.05	2.15	1.94	0.09	0.26
2.05	2.15	1.94	0.14	0.26
2.05	2.15	1.94	0.21	0.26

Significant at 0.05 level.

Post-test differences on Explosive power between the yogic practices, physical exercises and control group were 0.09, 0.14 and 0.21. values are greater than the confidence interval value 0.26, which shows significant difference at 0.05 level. Results were shown that there is a significant difference in post-test. It shows that physical exercise is better than yogic practices and control group were improved in explosive power

3. RESTING PULSE RATE

Aim- To record the resting pulse rate of each subject per minute.

Equipment used- stop watch and bio monitor was used to measure the resting pulse rate

Procedure-

Pulse rate was monitored by pulse monitor. This were recorded in a sitting position, in the morning session. Players to sit down on the bench and relax for 15 minutes for the test. The number of pulse beats per minute were recorded.

Results-

1. Mean and 't' test for resting pulse rate

	Yogic practices group	Physical exercise group	Control group
Pre test	76.35	75.26	76.3
Post test	73.5	71.36	76.66
't' value	5.90	7.88	0.10

Significant at 0.05 level

Resting heart rate are expressed in pulse beat / minute

Pre and post-test on Resting heart rate of yogic practices, physical exercises and control groups are 5.90, 7.88 and 0.10. 't' ratio value of Experimental groups are greater than the table value. training programmed had significantly improved the performance of Resting heart rate. the control group has not improved significantly. 't' value is less than the table value.

2. Analysis of co-variance on resting pulse rate

Yogic practices group	Physical exercise group	Control group
74.3	72.3	76.2

Source of variance	Sum of squares	Df	Mean square	'F' ratio
Within	123.40	56	2.3	34.23
Between	151.2	2	75.15	34.23

Significant at 0.05 level of confidence



Post-test values of yogic practices, physical exercises and control groups are 74.3, 72.3 and 76.2. F-ratio is 34.23. it is greater than the table value study shows that there was significant difference among the adjusted post-test. Scheffe's post-hoc test was applied to find out the paired significant difference.

3. scheffe's test for resting pulse rate

Yogic practice group	Physical exercise group	Control group	Mean differences	Confidence interval
74.13	72.40	75.30	1.80	1.20
74.13	72.40	75.30	2.10	1.20
74.13	72.40	75.30	3.89	1.20

Significant at 0.05 level.

Post-test differences on Resting heart rate between the yogic practice group, physical exercises group control group were 1.80, 2.10 and 3.89. The values are greater than the confidence interval value 1.20. it shows significant difference at 0.05 level of confidence. from the results of the study that there is a significant difference in resting heart rate between the post-test means of yogic practice group and physical exercises group and control group results show that physical exercises group is better than yogic practice group and control group in improving Resting heart rate.

4. BREATHE HOLDING TIME

AIM- measure the ability of the players for hold the breath to a longer time

EQUIPMENT USED-

Stop watch and score sheets

PROCEDURE

Players inhaled deeply after which he held his breath for length of time possible to him. The index finger serves an indicator to the investigator to know the start and end of the recording time. The thumb and middle finger were used to hold the nose. For recording the breath holding time, Player were requested not to let the air out by opening the mouth. The time of holding the breath till one subject let the air out was clocked by using the stopwatch to the nearest one tenth of a second as breath- holding time.

Results-

1. Mean and 't' test for breathing holding time

	Yogic practices group	Physical exercise group	Control group
Pre test	33.61	33.32	33.30
Post test	37.44	39.50	33.26
't' value	9.50	15.27	0.08

Significant at 0.05 level.

Breath holding time are expressed in seconds.

t-ratio between the pre and post-test on Breath holding time of yogic practices, physical exercises and control groups are 9.50, 15.27 and 0.08. 't' ratio value of Experimental groups are greater than the table value. Training programmed had significantly improved the performance of Breath holding time. the control group has not improved significantly. 't' value is less than the table value, as they were not subjected to any specific training.

2. Analysis of co-variance on breath holding time

Yogic practices group	Physical exercise group	Control group
37.8	39.20	33.10

Source of variance	Sum of squares	Df	Mean square	'F' ratio
Within	133.46	56	2.50	79.88
Between	381.8	2	190.88	79.88

Significant at 0.05 level of confidence.

Post-test values of yogic practices, physical exercises and control groups are 37.8, 39.20 and 33.10. the obtained F-ratio is 79.88. it is greater than the table value. results indicate that there was significant difference among the post-test of yogic practices, physical exercises and control groups on Breath holding time. Scheffe's post-hoc test was applied to find out the paired significant difference.

**3. scheffe's test for breath holding time**

Yogic practice group	Physical exercise group	Control group	Mean differences	Confidence interval
36.9	39.20	34.07	2.44	1.50
36.9	39.20	34.07	3.80	1.50
36.9	39.20	34.07	6.20	1.50

Significant at 0.05 level.

Post-test differ in Breath holding time between the yogic practice group, physical exercises group and control group were 2.44, 3.80 and 6.20. The values are greater than the confidence value 1.50. shows significant difference at 0.05 level of confidence. the results of the study show the significant difference in Breath holding time between the post-test means of yogic practice group, physical exercises group and control group.

physical exercises group is better than yogic practice group and control group in improving Breath holding time.

5. STRESS

AIM- To study the stress level of handball player.

Equipment Used

Everly and Girdano's Stress questionnaire

Procedure

For measuring the stress level everly and girdano's questionnaires were used. There were four levels of responses almost, always, seldom true and never true. Players were made to mark a tick in the column which every true his nature. Scorings helps the inventory. Scores were treated as individual scores. Its range of 14 to 56. For lower the psychological stress, score should also less.

Result-**1. Mean and dependent't' test on stress**

	Yogic practices group	Physical exercise group	Control group
Pre test	15.1	15.25	15.30
Post test	14	12.1	15.2
't' value	7.10	11.6	0.29

Significant at 0.05 level

Stress scores are expressed in points.

t-ratio values between the pre and post-test means on Stress of yogic practices, physical exercises and control groups are 7.10, 11.6 and 0.29. 't' ratio value of Experimental groups are greater than the table value. Training programmed had improved the performance of Stress. control group has not improved significantly. 't' value is less than the table value.

2. Analysis of co-variance stress

Yogic practices group	Physical exercise group	Control group
13.16	11.78	14.56

Source of variance	Sum of squares	Df	Mean square	'F' ratio
Within	36.89	56	0.77	57.9
Between	75.20	2	37.89	57.9

Significant at 0.05 level of confidence

post-test values of yogic practices, physical exercises and control groups are 13.16, 11.78 and 14.56. F-ratio is 57.9. it is greater than the table value with df 2 and 56 required for significance at 0.05 level of confidence. study indicates that there were significant difference among the post-test of yogic practices, physical exercises and control groups on Stress. Scheffe's post-hoc test was applied to find out the paired significant difference.

3. Scheffe's test for stress

Yogic practice group	Physical exercise group	Control group	Mean differences	Confidence interval
14.11	12.01	15	1.80	0.66
14.11	12.01	15	1.50	0.66
14.11	12.01	15	2.89	0.66

Significant at 0.05 level.

Post-test differ in Stress between the yogic practice group, physical exercises group and control group were 1.90, 1.50 and 2.89. These values are greater than the confidence value 0.66. it shows significant difference at 0.05 level of confidence. from the results



shows that there is a significant difference in Stress between the post-test means of yogic practice group, physical exercises group control group. physical exercises group is better than yogic practice group and control group in improving Stress.

DISCUSSION ON PHYSICAL, PHYSIOLOGICAL AND PSYCHOLOGICAL VARIABLES

Physical Variables

Study shows that group I (yogic practices) and group II (physical exercise) has improve the physical variables like Flexibility, Explosive Power and Cardio-Respiratory Endurance when it was compared with control group. By comparing with yogic practices and control groups, physical exercise has a greater improvement effect. Some study shows the effects of yogic training on endurance and flexibility.

Physiological Variables

Study shows that Yogic practices and Physical exercises improves the blood pressure, resting heart rate and breath holding time. Physical exercise training gives better effects as compare to yogic practises and control group.

Psychological Variables

Study shows that group 1 yogic practises and group 2 physical exercise improved the psychological variables like anxiety, aggression and stress but control group did not have any significant effect. Physical exercise training has greater effect. Study show that there is a significant difference in between yogic practices and physical exercises in developing variables like anxiety, aggression and stress.

SUMMARY AND CONCLUSION

This study was done to known about the effect of yogic practices and physical exercises on Physical, Physiological and Psychological variables of handball player of Rajasthan state. In this study, seventy handball players were selected for the different types of test. The age of players was 18 to 21years. These players further divided into two groups along with a control group. First group is yogic practices and second group is physical group. These groups done their practices and exercises for twelve with five days per weeks. Control groups remain constant in every situation. It did not engage for any types of exercise and practices. The groups are then divided into physical, physiological and psychological variables. These variables are then goes to the standardized tests. Pre and post testing data were collected after twelve week of training period. These data were then analysed by 't' test and ANCOVA analysis. F ratio and scheffee's post-hoc test has a greater effect on post-test. 0.05 level was fixed for level of confidence for testing the hypotheses.

Results were shown that there is a greater improvement in all variables (physical, physiological and Psychological variables) due to yogic practices and physical exercises in handball players of Rajasthan state.

In yogic practice and physical exercises and control group there is an significant difference.

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