

Effect of Hatha Yoga on Physical Fitness of School Level Students

Dr. Shikha Bansal, Associate Professor, SV Jain College, Bhadra
Dr. Vikesh Kamra, Associate Professor, Victorious Girls College, Amritsar

ABSTRACT

In this modern and competitive world, it is a big problem is hard to find time for physical activities. But all the people want to stay in perfect body structure. We all know about the importance of exercise in our daily life. Yoga is also simply, a seated training which is very beneficial for health and athletic ability. Regular yoga practice makes our body strong and flexible. Asana improves the stretching and relaxing ability of muscles and is very helpful for skeletal system of human body. This reduces the risk of injuring ligaments and tendon. Asana is the third limbs of Astang yoga. It is also called posture. A steady and good posture is very helpful to produces mental and physical equilibrium. It is not only a gymnastic exercise. With the help of postures, we exercise every muscle, nerve and glands of body. We discipline our mind, reduce fatigue and relax the nerves with regular exercises of yoga Asana. The present article has been planned to present the analysis and interpretation of present research work. As per the formulated objectives the present study has been designed to investigate the effects of hatha yoga on physical fitness, physiological and hematological variables of school level students respectively. For accomplishing the study four groups were randomly assigned. Out of four groups, Group A was assigned yoga asanas training, group B was subjected to pranayamas training and group C was yoga asanas and pranayamas combination for the duration of 12 weeks with five days per week while group D was monitored as control group. The control group was not participated in any training programme. In the aspect of speed (50-meter dash) a noticeable decrease was observed in the time of 50-meter dash after the training among the groups. After ensuring equal error variance among the groups, it was observed during post-test that all three training programmes significantly improved the speed of students but control group improved non-significantly. The training groups were significantly better than control group for enhancing speed of students. It was concluded on the basis of the obtained outcomes that significance influence of Hatha Yoga training on physical fitness variable was noticed after adjusted the mean values (covariate) therefore, the null hypothesis which was formulated earlier that "there is no significant difference in physical fitness variables on yoga asana group, pranayama group and asana pranayama combined group due to their respective hatha yoga training with relatively control group" was not accepted. In Physical variables, Yoga asana was good for strength and flexibility but combined training of yoga asana and pranayama had effectively improved speed, agility and endurance among students.

Keywords: Hatha yoga, Physical fitness, Ashana

1. INTRODUCTION

In the eleventh century A.D., hatha yoga's beginnings were discovered. In the Sanskrit language, the term "hatha" is formed from two syllables, ha and tha, which meaning "sun" and "moon." Sun-moon yoga is another name for it. Keeping the front and back, left and right, and other polar opposites of one's body in harmony is a benefit of this technique. Hatha Yoga is a kind of yoga that emphasises the development of the individual through the use of physical resources. According to some yoga gurus, hatha

yoga was designed by specialists to assist individuals maintain their health amid spiritual dark periods. "Hatha Sampradaya is the primary lineage of hatha yoga in India" (White & Gordon, 2012).

Eight paths of practise make up Hatha yoga, however the focus is mostly on two of them. Posture and breathing were the two routes to choose. Pranayama, according to the yoga teacher, is the most vital component of our body's metabolic activity. We breathe around 23000 times a day and utilise about 4500 litres of air each day, which increases during physical activity.

As a result, breathing exercises are critical to overall wellness. Breath is the source of our prana, or life power. In order to live a long and healthy life, we must learn how to breathe properly. Breathing technique known as pranayama is an important part of yoga. Controlling the life force is taught here. In pranayama, we learn how to breathe properly and deeply, and we do this through practising.

Yoga asana, on the other hand, is extremely beneficial for increasing our physical flexibility, stability, and strength. Each asana has a certain shape and sequence of actions that may be used to achieve the appropriate body posture. The asanas and pranayamas of yoga have been shown in studies to improve health and build muscle mass throughout the body. Both forms of exercise strengthen the muscles that support the organs and glands inside the body.

Hatha yoga, like any other kind of exercise, aids in strengthening and toning the body. All the advantages of asana may be ours if we practise them safely and regularly. They infuse physical and mental well-being with enlightened energy. Asanas are quite beneficial for regulating one's own energy. In addition to preventing cancer, diabetes, hypertension, renal failure and mental illness from developing, regular yoga practise can also help us maintain a healthy weight. Since its inception, it has evolved into a widely used physical fitness, stress reduction, and relaxation method (Burley, 2000).

Yoga is a practise that aims to bring the mind and body into perfect harmony. One can practise many aspects of yoga by engaging in asanas, pranayama, bandha exercises, and shatkarma. The more we practise them, the more we have an expanded perspective on life. A yoga practise may help a person's life become more centred, productive, and noble. So yoga is a discipline that impacts our daily peace with human beings via physical routines with or without a spiritual toning. When compared to other forms of yoga, Hatha yoga places a greater emphasis on physical fitness (Paul, 1982).

2. RESEARCH METHODOLOGY

The study's methodology is described in detail in this article. These findings are based on a well-designed study that utilised a variety of methods including a pilot study, training sessions for researchers and participants, testing procedures, data gathering, and statistical analysis to arrive at its conclusions.

2.1 Design of the Study

In order to examine the effects of hatha yoga on physical fitness, physiological, and haematological variables in school-aged kids, this study was conducted in an experimental manner.

2.2 Selection of Subjects

All 265 male students in the 9th to 12th grades at the Govt. Sr. Sec. School, Ugalan, District Hisar (Haryana), were selected as participants for this study by means of non-probability (purposive) sampling. They were randomly separated into four groups of equal size, each with 25 participants. Experiment Asana training (AT), pranayamas training (PT), and combined training (AT/PT for 12 weeks, 5 days per week) were provided to three groups, while a fourth group was used as a control for comparison. They didn't engage in any training programmes. The control group. The selected participants were evaluated by a licenced physician who determined that they were healthy enough to participate in the research. A thorough explanation of the study's goals and methods was provided to each participant. In most cases, parents' permission was required because the subjects were primarily schoolchildren under the age of 18.

2.3 Dependent Variables

Analyzed in this study were the following aspects of participants' physical fitness, physiological health, and haemoglobin levels:

2.4 Physical Fitness Variables (Components):

1. 1.Speed
2. Strength
3. Agility
4. Flexibility
5. Endurance

2.5 Selection of Tests

These findings show that physical characteristics can be affected by hatha yoga. Measurement of the variables was done using this test.

2.6 Physical Fitness Tests

Students' physical fitness was assessed using the AAHPHER YOUTH FITNESS Exam BATTERY (1976) and their flexibility was assessed using the AAHPERD (1980) test.

1. Speed – 50 Mts. dash running
2. Strength – Standing broad jump
3. Agility – shuttle run
4. Flexibility – Sit and Reach
5. Endurance - 12 Minutes' walk /run

2.7 Statistical Procedure

During the pre-test, the homogeneity of the sample was tested using the Levene's test in four groups. Training's effects were evaluated and compared using paired sample t-tests on the pre- and post-test results of each group. Univariate analysis of covariance was used to discover the best efficient training programme for each and every parameter related to physical fitness, physiological and haematological well-being (ANCOVA). To exclude the effects of a third factor's covariance on the dependent variable, a one-way analysis of variance (ANOVA) with an analysis of covariance was performed. We also looked at the impacts of the groups' interactions in order to determine the effects of the training given to each group. For all inferential statistics, the level of significance was 95 percent.

3. DATA ANALYSIS AND RESULT

In order to maintain and improve one's physical fitness, one should engage in some type of physical activity on a regular basis. Ancient Indians recognised the importance of yoga in generating balance, attaining strength, increasing flexibility, and calming the body via postures, basic motions and breathing patterns. Yoga is now being studied and practised by people all around the world.

The purpose of this article is to analyse and understand the results of current research. The purpose of this study is to examine the effects of hatha yoga on school-level kids' physical fitness, physiological health, and haemoglobin levels, all in accordance with the established objectives. Four groups were allocated at random to carry out the research. During the course of 12 weeks, five days a week, groups A, B, and C all received yoga asanas training, while group D was observed as the control group. Group C also received yoga asanas and pranayamas instruction. None of the participants in the control group took part in any training programme at all.

Training's effects were evaluated and compared using paired sample t-tests on the pre- and post-test results of each group. One way analysis of covariance was used to compare different training regimens for various aspects of physical fitness, physiological health, and haematological well-being (ANCOVA). To exclude the effects of a third factor's covariance on the dependent variable, a one-way analysis of variance (ANOVA) with an analysis of covariance was performed. We also looked at the impacts of the groups' interactions in order to determine the effects of the training given to each group. For all inferential statistics, the level of significance was 95 percent. In order to ensure that the collected data was normal, the

Levene's test of equality of error variance was performed using SPSS (Statistical Package for Social Science) version 20.0.

3.1 Analysis of Physical Fitness Parameters

3.1.1 For, Objectives:

Determine the physical fitness impacts of asana training, pranayama training, or the combination of both on their respective groups of participants.

For the purpose of determining whether asana, pranayama, and asana & pranayama combination training has the greatest influence on physical fitness variables.

3.1.2 (Null Hypotheses):

Due to their separate hatha yoga trainings, yoga asana, pranayama, and asana & pranayama combined groups would all have similar physical fitness factors.

Preliminary research suggested that asana and pranic training, as well as the combination of the two, had an equivalent impact on physical fitness in their respective groups.

1. Speed

Speed of students was assessed with 50m dash run. The time taken by them was noted in seconds.

Table 1 Mean speed for 50 m dash (Second) run among groups in pre-test

Group	N	Mean	Std. Deviation	Levene Statistic	p-value
Group A	25	8.12	0.73	1.749	0.162 ^{NS}
Group B	25	8.44	1.13		
Group C	25	8.12	0.58		
Group D	25	8.17	0.74		
Total	100	8.21	0.82		

NS- Non-Significant ($p>0.05$)

Table 1 shows the pre-test mean and standard deviation statistics for the various groups. Group A (Yoga Asana) had a mean and standard deviation of 8.12 0.73; Group B (Pranayama) had a mean and standard deviation of 8.44 1.13; Group C (Asana and Pranayama Mixed Group) had a mean and standard deviation of 8.12 0.58; and Group D (Control group) had a mean and standard deviation of 8.17 0.74. The average time for a 50-meter sprint among 100 pupils was 8.21 seconds. When students from diverse classes ran the 50-meter dash, the Levene Statistic(1.749) found that the homogeneity of variances was not significant (0.162; $p>0.05$).

2. Strength

The researcher had considered broad jump as a measure of strength. The unit for broad jump was meter.

Table 2 Average strength during broad jump (meter) by groups in pre-test

Group	N	Mean	Std. Deviation	Levene Statistic	p-value
Group A	25	1.70	0.20	0.572	0.635 ^{NS}
Group B	25	1.77	0.17		
Group C	25	1.80	0.22		
Group D	25	1.79	0.22		
Total	100	1.77	0.20		

Table 2 shows the average standing wide jump strength of students in various groups throughout the pre-test. Group A's mean strength score was 1.70 0.20, Group 100 B's score was 1.77 0.17, Group C's score was 1.80 0.22, and Group D's score was 1.79 0.22. The average broad jump was 1.77 0.20 metres among 100 students. According to Levene Statistic, homogeneity of variances was not significant (0.635; $p>0.05$) (0.572).

3. Agility:

The agility among students was assessed while performing shuttle run. The measuring unit was seconds.

Table 3: Average agility while Shuttle Run (seconds) among groups in pre-test

Group	N	Mean	Std. Deviation	Levene Statistic	p-value
Group A	25	11.67	0.58	1.033	0.328 ^{NS}
Group B	25	11.78	0.82		
Group C	25	11.40	0.56		
Group D	25	11.89	0.55		
Total	100	11.69	0.65		

NS- Non-Significant($p>0.05$)

During the Shuttle Run pre-test, the average agility of students in various groups was shown in Table 3. A, B, C, and D all obtained mean strength scores of 11.67 0.58, 11.78 0.82, 11.40 0.56, and 11.989 0.55 correspondingly in the strength test. 100 pupils were tested, and their average agility was 11.69 0.65 seconds. According to the Levene Statistic, the Homogeneity of Variances was determined to be insignificant (0.382; $p>0.05$) (1.033).

4. Flexibility

Among physical fitness parameter to assess the flexibility of students, researcher had conducted sit and reach test using measuring unit as centimeter.

Table 4: Average flexibility for sit and reach(cm.) among groups in pre-test

Group	N	Mean	Std. Deviation	Levene Statistic	p-value
Group A	25	7.41	4.19	1.033	0.382 ^{NS}
Group B	25	8.24	3.19		
Group C	25	7.56	3.95		
Group D	25	5.84	3.66		
Total	100	7.21	3.80		

S- Significant ($p<0.05$)

Table 4 illustrates the research groups' pre-test flexibility. No significant differences in flexibility were identified across groups ($p = 0.382$; $p > 0.05$). Group B was the most flexible (M-8.04), while Group D was the least flexible (M-5.84). sit-and-reach testing flexibility.

5. Endurance

The researcher had opted cooper run/walk test (12 Minutes). The distance covered in meters during 12 minutes was noted for rating endurance of students.

Table 5: Average pre-test endurance for 12 minute walk/run(meter)

Group	N	Mean	Std. Deviation	Levene Statistic	p-value
Group A	25	1852.80	233.80	2.466	0.067 ^{NS}
Group B	25	1851.20	236.29		
Group C	25	1956.40	193.49		
Group D	25	1795.20	163.30		
Total	100	1863.90	213.90		

NS- Non-Significant($p>0.05$)

Table 5 shows that students from all groups had similar levels of pre-test endurance. When the variance was tested, a non-significant p-value of (0.067) was produced. During a 12-minute

walk and run, all pupils averaged an endurance of 1863.90 metres. Group A's endurance ($M=1852.80$) and Group B's ($M=1851.20$) were nearly identical, while Group C's ($M=1956.40$) endurance was the highest and Group D's ($M=1795.20$) lowest.

3.2 Discussion on Findings

Students at the elementary and secondary school levels were recruited for this study to assess the effects of Hatha Yoga on their physical fitness, physiology, and haematological parameters. The experiment was conducted using a methodical approach to experimental research. A total of 100 people were selected from the general community and separated into four groups, which were then compared. Each group was made up of 25 participants, all of whom were chosen at random. There were three groups: Group A was given yoga Asana training, Group B Pranayama instruction, and Group C a mix of the two. Group D was kept as a control group and followed for 12 weeks. The people in the "control" group did not take part in any sort of training. The covariance analysis was done to determine the impact of varied training on the dependent variable.

3.3 Physical Fitness Variables

When it comes to speed (50 metre dash), all the groups saw significant decreases in their time following training. During the post-test, it was discovered that all three training programmes greatly increased students' speed, whereas the control group showed no such improvement. Compared to the control group, pupils in training groups were much faster. Mixed training in the form of yoga postures and pranayama was shown to be extremely successful, with an adjusted mean ($M=7.71$ seconds) time of 50 metres for the sprint. The standing broad jump was used to gauge the athletes' overall strength. All three training groups except the control group showed a substantial increase in mean strength compared to pre-test. Asana (1.92 m) is the most effective yoga pose among the others. However, yoga and pranayama dramatically increased agility in the Mixed Group, whereas the Control Group did not. According to the results, a superior strategy for improving agility is mix training. Statistically significant improvements in flexibility were seen for all training groups during the trial. It was discovered that the Yoga asana group had the greatest pre-post mean difference (-2.344). Control and Yoga Asana Group had the largest mean difference in comparison to the other groups. Among all groups, the adjusted mean for the Yoga asana class was the highest. Endurance training programmes had a considerable impact on students' post-intervention results. With a mean difference of -122.800 between pre- and post-tests, combined asana and pranayama training has the greatest impact on endurance. In terms of the physical components, yoga trainings were shown to be significant. Analogous research Rani & Malik (2017), and Swamy & Patil (2009) (2016). All of the research included in this article found yoga to have a substantial impact on physical fitness. The results of previous investigations backed up the conclusions of this one.

4. CONCLUSION

Ancient India's yoga is a blend of spiritual, mental, and physical practises. Current study shows that yogic practise has a positive impact on a variety of physical metrics. In the topic of Yoga, there is a lot of room for study in many different dimensions. Null hypothesis that "there is no significant difference in physical fitness variables on yoga asana group, pranayama group, and asana-pranayama combined group due to their respective hatha yoga training with relatively control group" was rejected based on the results of the study, which found a significant influence of Hatha Yoga training on physical fitness variables after adjustment of the mean values (covariate). Yoga asana is beneficial for building strength and flexibility, but students' speed, agility, and endurance increased when they paired it with pranayama training. All haematological variables, except haemoglobin, had no significant effect on blood pressure or resting heart rate or breath-holding capacity according to the results of this study, which shows

that different yoga trainings were significantly effective on physical fitness components like speed, strength, flexibility, endurance, and agility.

REFERENCES

1. Bhavanani, Ananda, Ramanathan, Meena, Dayanidy, Ganesan, Trakroo, Madanmohan & K, Renuka (2017). A Comparative Study of the Differential Effects of Short Term Asana and Pranayama Training on Reaction Time. *Annals of Medical and Health Sciences Research*, 7, 80-83
2. Chauhan, A., Semwal, D. K., Mishra, S. P., & Semwal, R. B. (2017). Yoga Practice Improves the Body Mass Index and Blood Pressure: A Randomized Controlled Trial. *International journal of yoga*, 10(2), 103–106.
3. Divya, T. S., Vijayalakshmi, M. T., Mini, K., Asish, K., Pushpalatha, M., & Suresh, V. (2017). Cardiopulmonary and metabolic effects of yoga in healthy volunteers. *International Journal of Yoga*, 10(3), 115-120. doi: 10.4103/09736131.186162.
4. Kim, S., & Ju, S. (2017). Elderly-customized hatha yoga effects on the vascular inflammation factors of elderly women. *Journal of physical therapy science*, 29(10), 1708–1711.
5. Yadav R., S. Das (2001) Effect of yogic practice on pulmonary functions In young females. *Indian J. Physiol. Pharmacol.*, 45(4): 493-496.
6. Williams K., C. Abildso, L. Steinberg, E. Doyle, B. Epstein, D. Smith et al. (2009) Evaluation of the effectiveness and efficacy of Iyengar yoga therapy on chronic low back pain. *Spine*, 34(19): 2066-2076.
7. Shapiro D., I. Cook, D. Davydov, C. Ottaviani, A. Leuchter, M. Abrams (2007) Yoga as a complementary treatment of depression: effects of traits and moods on treatment outcome. *Evidence-Based Complement. Altern. Med.*, 4(4): 493-502.
8. Seo D., S. Lee, A. Figueroa, H. Kim, Y. Baek, Y. Kwak et al. (2012) Yoga training improves metabolic parameters in obese boys. *Korean J. Physiol. Pharmacol.*, 16: 175-180.

