

A Study on the Effect of Yogic Innervation at Haemoglobin Level among the College going Girls

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Introduction

The objective of this study is to investigate the effect of yoga on the haemoglobin levels of female college students. Haemoglobin is an iron-containing protein in RBC whose main function is to carry oxygen from lungs to organs. Low haemoglobin levels also referred to as anemia creates many health issues like fatigue, rapid heart rate, pain, anxiety, dizziness, etc. Yoga is an ancient spiritual discipline of India which integrates postures, breathing, and meditation to bring harmony between body and mind. There is documented evidence that yoga has a preventive and therapeutic effect on many diseases. There is limited information on the effect of yoga on haemoglobin levels; this study was conducted to assess the suitability of yoga as an alternative treatment for restoring haemoglobin levels.

At present time the people have an irregular daily schedule which is a cause of numerous adverse effects on the health. As compared to men, women are more likely to face such health issues. According to **World Health**

Organisation, about 2 billion people in the world have low haemoglobin levels, 47.5% of whom are school and college-going girls.

At the world level, 9 out of 10 haemoglobin deficient people live in developing countries. These 2 billion people have low haemoglobin levels due to a deficiency of iron in the body. In south-east Asia, about 600 million people have low iron and haemoglobin levels. In India 87%, in Thailand 13.4%, in Bangladesh 74%, in Nepal 63%, and in Indonesia 51% of people are suffering from low haemoglobin levels.

According to **National Family Health Survey**, about 55% of Indian women have low haemoglobin levels. Among them 39% have mild haemoglobin deficiency, 15% have moderate haemoglobin deficiency and 2 % have acute haemoglobin deficiency. Several studies in developing countries have concluded that lack of nutrition is the key cause of haemoglobin deficiency in adolescent girls.

Among developing countries, India has the most severe extent of haemoglobin deficiency. In India, women face this problem more than men. In 20% cases, maternal anemia is the reason for maternal mortality.

According to **National Family Health Survey** in India 72% of women in Assam, 69.7% women in Haryana, 68.4% women in Jharkhand, and 45.2% women in Karnataka are haemoglobin deficient which is a cause of concern. According to the **National Family Health Survey**, 59.8% of people in Uttarakhand have anemia. Among them 44% have mild anemia, 13% have moderate anemia and 2% have acute anemia.

Anemia is a condition in which the body doesn't produce enough red blood cells and the oxygen-carrying capacity of the blood is decreased. There are different types of anemia but generally, it's caused by inadequate intake of iron. Other causes of anemia are gastrointestinal bleeding, menorrhagia, malnutrition, metabolic disorders, etc. With the decrease in Haemoglobin levels Total Leukocyte Count(TLC) of blood also decreases. Low TLC weakens the immune system which makes the body prone to infections.

Some of the previous studies have explored the role of physical activity in enhancing the haemoglobin levels of the body.

Ajmani RS et al. (2003) has studied the effect of treadmill exercise(aerobic) on 14 people which showed a substantial gain in haemoglobin levels.

Mehmot O (2003) observed that the Yoga routine causes a significant change in RBC and platelet count.

Moosavizademonir (2011) studied the effects of 8 weeks of aerobic training on haemoglobin, RBC, and HCT levels of 14 female athletes. After 8 weeks haemoglobin and HCT levels were normal and there was a significant increase in RBC count.

Sazavar et al. (2012) investigated the effects of aerobic exercise on haematological parameters. 26 university students(aged between 19-23 years) were selected for study and then divided into two groups(13 in controlled group and 13 in experimental group). The experimental group did aerobic exercises 3 times a week. After 8 weeks there was an increase in haemoglobin and HCT levels of the experimental group.

Sahay Lata Rani (2012) studied effects of yoga on the physical, psychological, haematological parameters, and performance of 40 female college volleyball players. After the experiment, all four parameters showed significant gains.

B. Ramnath et al. (2013) chose a group of people aged between 15-40 years to practice yoga for 90 days. After 90 days haemoglobin levels were positively influenced.

Sharma KK et al. (2015) observed 23 anemic women aged between 20-25 years in a hostel of Mangalore University. These women practiced yoga for 30 days. 12 women were in the experimental group and 11 women were in the control group. During the study statistics for pre and post-

Haemoglobin, WBC, PCV, and PEFr levels were studied. Positive effects on the above parameters were observed in the experimental group.

Sharma Nina(2015) studied 100 patients with anemia(50 men and 50 women) aged between 25-30 years. Their haemoglobin, RBC, WBC, and platelets count were observed. It was observed haemoglobin and RBC counts were increased for both men and women. While WBC count was decreased for both men and women. The result shows yoga has an unprecedented effect on anemia.

Sampling and Selection Method

For this study, 80 female undergraduate and postgraduate students were drawn from Government PG College Dakpathar. The subjects(n=80) were divided into two groups using simple random sampling: 40 in the experimental group and 40 in the control

group. The study was conducted for 90 days; pre-post data were noted before and after the intervention.

Selected undergraduate and postgraduate female students(experimental group and control group) were asked to gather at college in the morning before the commencement of yoga training. Their blood samples were collected and later sent to the laboratory by a local medical expert. The experimental group was given 60-minute yoga training for the duration of 90 days after the pre-experiment test.

After 90 days of yoga training concluded both the experimental group and control group gathered at college. The local medical expert sent the blood samples to the laboratory.

During the period of the experiment, the control group did not participate in Yoga practice and was asked to follow their usual daily routine.

Table 1

Field of Study	Total no. of Subjects(n)	Random Group	
		Number of subjects in exp. group	Number of subjects in ctrl. group
Govt Degree College Dakpathar Dehradun (Uttarakhand)	n=80	40	40

Selection of Variables

Following variables have been selected for this research –

Independent Variables –

For 90 days of training , Yoga training was selected as the independent variable. In Yoga training asanas(poses) and pranayama(breathing exercises)were selected as independent variable.

Asana(poses)

During the training period following asanas were selected –

a Tadasana

Ardhamatsendrasana

Pashchimottanasna

Naukasana

Dhanurasana

Suryanamaskar

Shavasana

Pranayam(breathing exercises)

During training period following pranayamas were selected –

Nadishodan

Bhastrika

Ujjai

Bharamri

Table -2

S.No.	Practice	Round	Duration
1.	Tadasana	5	4
2.	Ardhamatsendrasana	5	4
3.	Pashchimottanasna	5	4
4.	Naukasana	5	4
5.	Dhanurasana	5	4
6.	Suryanamaskar	2	5
7.	Shavasana	—	10
8.	Nadishodan	15	10
9.	Bhastrika	5	5
10.	Ujjai	5	5
11.	Bharamri	5	5
Total Duration			60

Dependent Variables –

For 90 days of training, haemoglobin was selected as the dependent variable.

Tools of the Study –

For the dependent variable haemoglobin, blood samples of the female students were sent to the local laboratory. Complete Blood Count Test(CBC) was used to evaluate blood samples.

In this study Paired t-test was employed to find out the effect of independent variables on dependent variables namely hemoglobin, TLC, and body mass index. For the hypothesis test, the significance level was taken as $P < 0.05$.

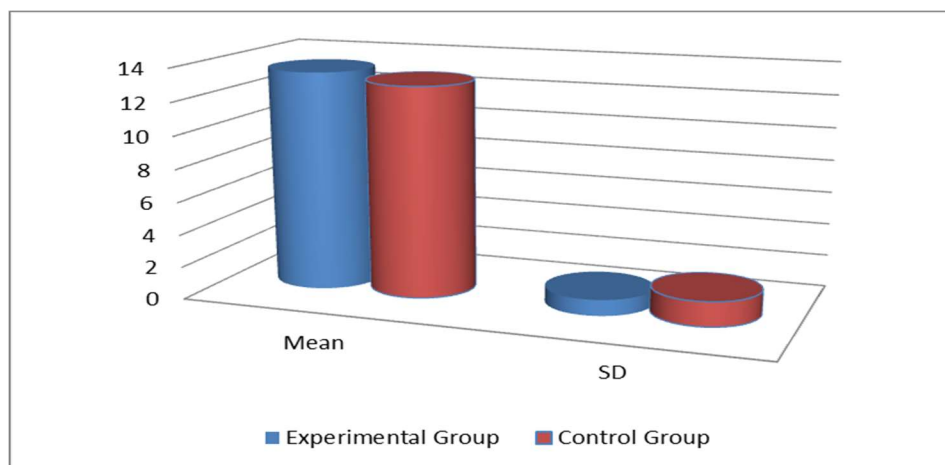
The effect of Yoga training on haemoglobin levels of the experimental group and control group has been presented on an analytical basis.

Statistical Method Used in the Study –

Table -3

Comparison of Haemoglobin Levels of Experimental and Control Group before Yoga Training

Test	N	Mean	SD	SED	R	t-value	Significance
Pre	40	13.43	0.98	0.342	0.016	1.540	$< 0.05^{NS}$
Pre	40	12.91	1.51				



After analysing above Table-3 and graph it was observed that there was no significant difference in haemoglobin levels of the

experimental group and control group. The average haemoglobin levels of both groups are almost the same. The mean of

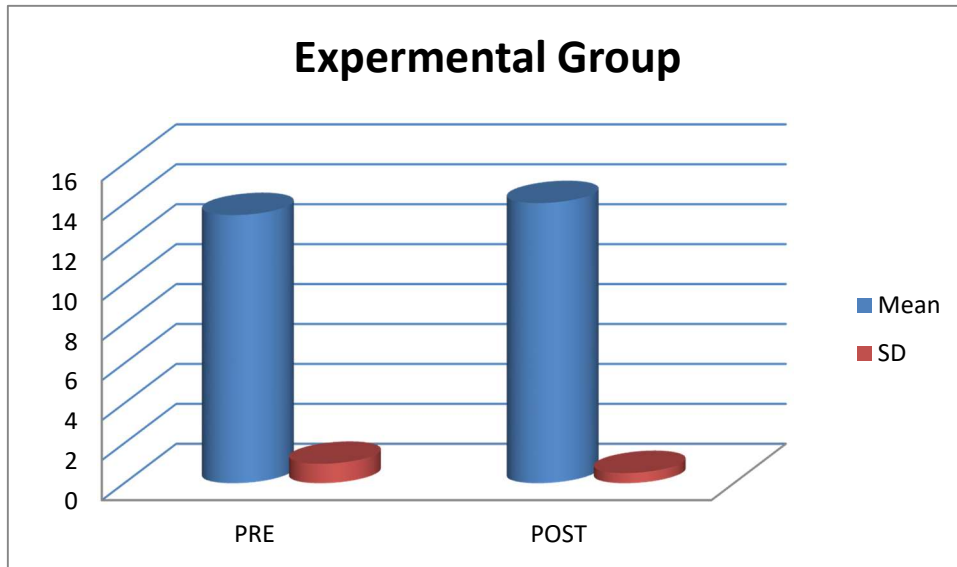
haemoglobin levels obtained from subjects of the experimental group and control group are respectively 13.43 and 12.91, the standard deviation is 0.97 and 1.926, and the

standard error of the difference is 0.349. For the level of degree of freedom(df) 78, t-value 1.540 was obtained which is not very significant.

Table -4

Comparison of Haemoglobin Levels of Experimental Group before and after 90 Days Yoga Training

Test	N	Mean	SD	SED	R	t-value	Significance
Pre	40	13.43	0.97	0.175	0.791	3.429	<0.05 ^s
Post	40	14.03	0.51				



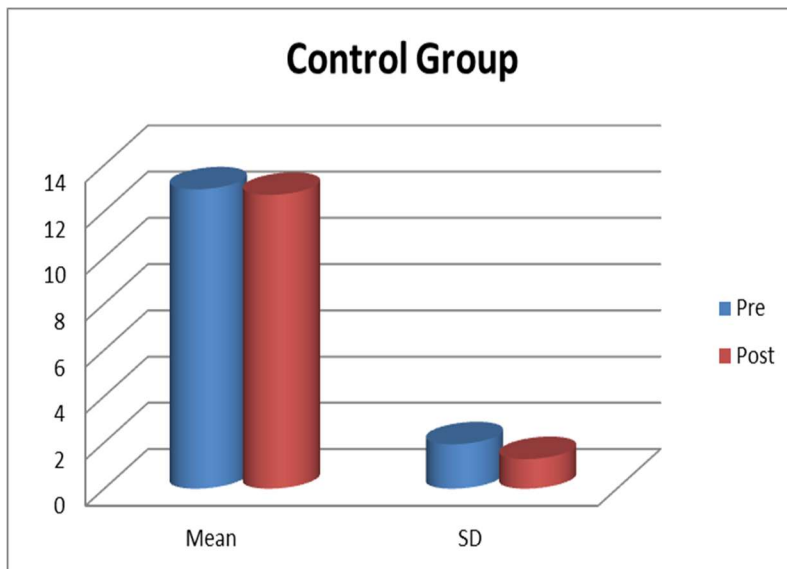
After analysing above Table-4 and graph it was observed that the mean haemoglobin of subjects of the experimental group was 13.43 which increased to 14.03 after yoga training. The above difference in the means shows significant improvement. Standard

deviation and the standard error of difference are respectively 0.51 and 0.97. For the level of degree of freedom(df) 39, t-value 3.429 was obtained which at the value of 0.05 is significant.

Table -5

Comparison of Haemoglobin Levels of Control Group before and after 90 Days Yoga Training

Test	N	Mean	SD	SED	R	t-value	Significance
Pre	40	12.91	1.926	0.366	0.883	0.526	<0.05 ^{NS}
Post	40	12.71	1.280				



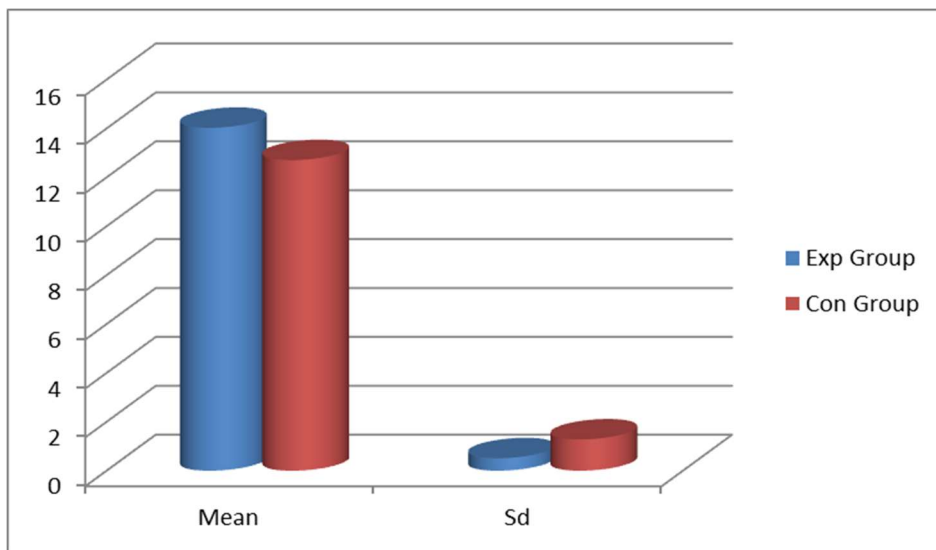
After analysing above Table-5 and graph it was observed mean of haemoglobin of subjects of the control group was 12.91 before the experiment and 12.71 after 90 days experiment. Standard deviation and the

standard error of difference are respectively 1.926 and 1.280. For the level of degree of freedom(df) 39, t-value 0.527 was obtained which at the value of 0.05 is insignificant.

Table -6

Comparison between Haemoglobin Levels of Experimental Group and Control Group after 90 Days Yoga Training

Test	N	Mean	SD	SED	R	t-value	Significance
Post	40	14.03	0.51	0.218	0.118	6.032	<0.05 ^S
Post	40	12.71	1.280				



After analysing above Table-6 and graph it was observed that there was a significant difference in haemoglobin levels of subjects of the experimental group and control group. The mean of haemoglobin levels obtained from subjects of the experimental group and control group are respectively 14.03 and 12.71, the standard deviation is 0.51 and 1.280, and the standard error of the difference is 0.281. For the level of degree of freedom(df) 78, t-value 6.032 was obtained which is significant.

Result –

Yoga balances the physical and psychological functions of the body and increases productivity. Yoga increases the breathing capacity of the lungs and increases the oxygen content of RBC. Yoga also boosts the circulation and metabolic process of the body. Yoga facilitates the uninterrupted flow of blood and oxygen which vitalizes all of organs. The function of haemoglobin protein is to carry oxygen from lungs to tissues and transport carbon dioxide from tissues to the lungs. Yoga practice improves blood oxygen levels in the body and significantly enhances haemoglobin levels

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