

EFFECT OF YOGA THERAPY, SUPPLEMENTATION OF GOOSEBERRY WITH HONEY AND COMBINED INTERVENTION ON HEMOGLOBIN CONCENTRATION AMONG ANAEMIC ADOLESCENT GIRLS

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ABSTRACT

This study aims to search out the effect of yoga therapy, gooseberry pulp with honey supplementation and combined treatment on Hemoglobin concentration of anaemic adolescent girls. To achieve the purpose of the study, sixty female students studying in Rajiv Gandhi Ayurveda Medical College, Mahe, Pondicherry State, India were selected as subjects. The age of the subjects was ranged from 18 to 23 years and subjects with iron deficiency anaemia were only selected for the present study. The selected subjects were randomly divided into four equal groups of 15 each. The group-I was given yogic therapy, group-II was provided supplementation of gooseberry with honey and group-III was given combined Yoga therapy and supplementation of gooseberry with honey for the period of twenty four weeks. The selected dependent variable hemoglobin concentration was assessed using standard tests and procedures, prior to and immediately after the training. Analysis of covariance (ANCOVA) was used as a statistical procedure to establish the significant difference, if any, existing between pretest and posttest data on selected dependent variable. The results of the study documented that, combined yoga therapy and supplementation of gooseberry with honey treatment was significantly better than isolated Yoga therapy and supplementation of gooseberry with honey treatments.

Key words: *Yoga therapy, Supplementation, Hemoglobin and Anaemic adolescent girls.*

INTRODUCTION

Anaemia is a major public health problem worldwide particularly in developing countries among women of reproductive age. As per national family health survey, more than half of women in India (55%) have anaemia, including 39% with mild anaemia 15% with moderate anaemia and 2% severe anaemia. Nearly 50-80% of Indian mothers suffer from anaemia due to iron deficiency.

Ayurveda is the traditional ancient Indian system of health science. The Ayurveda method of holistic health care emphasis balancing the body mind and spirit to treat and prevent disease. It focuses on harmonising the body with nature through diet herbal remedies yoga and meditation.

Yoga is an ancient Indian philosophy and the way of life, where complete harmony between our body and mind is achieved. It was co-ordinated and synthesised Maharishi Patanjali in his classical work, "The yoga sutras". Yoga therapy used postures, breathing exercises meditation to improve overall health by preventing, curing and rehabilitating from illness. Yoga therapy is a type of therapy derived from the yoga tradition of Pathanjali and the Ayurvedic system of health care that uses yoga postures, breathing exercises, meditation and guided imagery to improve mental and physical health.

Nutrition science seeks to explain metabolic and physiological responses of the body to diet. With advance molecular biology, biochemistry and genetics, nutrition science is additionally developing into the study of integrative metabolism, which seeks to connect diet and health through the lens of biochemical processes. The contribution that nutrition can make to the general health of any individual which has been generally accepted has not been given the attention it deserves. Physical activity is essential for normal development in early adolescence. Exercise alone cannot be beneficial to the body. Proper exercise and balanced diet are the true basic necessities for a healthy man. Fitness is a combination of heart and muscle capacity to use oxygen for energy production. Nutrition and well being hence assumes a vital role in the field of sports.

Gooseberry is one of the best antioxidants and rich source of vitamin-C. It helps in better absorption of the iron molecule and improves the haemoglobin concentration in the body and thus prevents anaemia. It can be taken in the form of solid fruit or as juice. Honey is very good for the entire body. It contains a good amount of iron about 0.42 mg of iron in 100 grams of honey. Honey also contains copper and magnesium that will help in increasing the haemoglobin in body.

Women and children are more prone to anaemia. Yoga therapy is a method of integrating the body, breath, mind and attaining ones' full potential and prescribed for better health condition. Some supplementations are helps to improve the anaemic condition and this aspect of role of Gooseberry with honey will have an anti-oxidant and other effects in improving the anaemic conditions of girls. The anti-oxidant effect of yoga and gooseberry supplementation with honey will be beneficial in the improvement of haematological, biochemical and clinical parameters of girls with anaemia. Although

human bodies are physically trained through their daily and weekly workouts, nutrition education is often overlooked in their regular training (Cole et al., 2005; Jonnalagadda, Rosenbloom, & Skinner, 2001). Hence, this study aims to search out the effect of yoga therapy, gooseberry pulp with honey supplementation and combined treatment on Hemoglobin concentration of anaemic adolescent girls.

METHODOLOGY

Subjects and Variables

To achieve the purpose of the study, sixty female students studying in Rajiv Gandhi Ayurveda Medical College, Mahe, Pondicherry State, India during the academic year 2016-2017 were selected as subjects. The age of the subjects was ranged from 18 to 23 years and subjects with iron deficiency anaemia were only selected for the present study. The selected subjects were randomly divided into four equal groups (three experimental groups and a control group) of 15 each. The yoga therapy, supplementation of gooseberry with honey and combined of Yoga therapy and supplementation of gooseberry with honey were selected as independent variables. The selected dependent variable Hemoglobin concentration was assessed using standard tests and procedures, prior to and immediately after the training.

Training Protocol

The group-I was given yogic therapy, group-II was provided supplementation of gooseberry with honey and group-III was given combined yoga therapy and supplementation of gooseberry with honey for the period of twenty four weeks. The following yogic practices such as padmasana, sarvangasana, bhujangasana, dhanurasana, salabhasana, shavasana, vajrasana and halasana were included in the yogic therapy treatment. The yogic therapy group (group-I) subjects underwent yoga practices six days a week for twenty four weeks. Gooseberry with honey was supplemented for subjects of group-II half an hour before dinner approximately 7.00 pm for twenty four weeks. Group-III was given combined yogic therapy and supplementation of gooseberry with honey. The training programme was conducted during the morning sessions between 5.30 -6.30 am.

Experimental Design and Statistical Procedure

The experimental design used for the present study was random group design involving sixty subjects. Analysis of covariance (ANCOVA) was used as a statistical procedure to establish the significant difference, if any, existing between pretest and

posttest data on selected dependent variable. The level of significance was accepted at $P < 0.05$.

RESULTS

Analysis of covariance on haemoglobin concentration of yoga therapy, supplementation of gooseberry with honey and combined Yoga therapy and supplementation of gooseberry with honey and control groups are given in table-I.

Table- I: Analysis of Covariance on Hemoglobin Concentration of Experimental and Control Group

Test	Yoga TherapyGroup	Supple- mentation Group	Combined Group	Control group	SV	SS	df	MS	‘F’ Ratio
Pre-test									
Mean	13.04	13.04	13.04	13.03	B	0.002	3	0.0007	0.18
SD	0.14	0.14	0.15	0.14	W	0.26	56	0.004	
Post-test									
Mean	12.95	12.91	12.89	13.06	B	0.22	3	0.07	35.00*
SD	0.14	0.13	0.13	0.13	W	0.12	56	0.002	
Adjusted Post-test									
Mean	12.97	12.94	12.89	13.05	Between Within	0.31 0.12	3 55	0.1 0.002	50.00*

* Significant at .05 level of confidence.

The table value required for significance at .05 level with df 3 and 56 & 3 and 55 are 2.772 and 2.775 respectively.

Table-I shows that the pre test mean values on haemoglobin concentration of yoga therapy, supplementation, combined treatment groups and control group are 13.04, 13.04, 13.04 and 13.03 respectively. The obtained "F" ratio value 0.18 for pre test scores on haemoglobin is less than the required table value 2.772 for significance with df 3 and 56. The post test mean values on haemoglobin concentration of yoga therapy, supplementation, combined treatment groups and control group are 12.95, 12.91, 12.89 and 13.06 respectively. The obtained "F" ratio value 35.00 for post test scores on haemoglobin concentration is more than the required table value 2.772 for significance with df 3 and 56.

The adjusted post test mean values on haemoglobin concentration of yoga therapy, supplementation, combined treatment groups and control group are 12.97, 12.94, 12.89 and 13.05 respectively. The obtained "F" ratio value 50.00 for adjusted post test mean values on haemoglobin is more than the required table value 2.775 for significance with df 3 and 55. The results of the study showed that there was significant difference exists among yoga

therapy, supplementation, combined treatment groups and control group on haemoglobin concentration.

Since, four groups were involved the Scheffe's test was applied to find out the paired mean differences if any, and it is presented in the table-II.

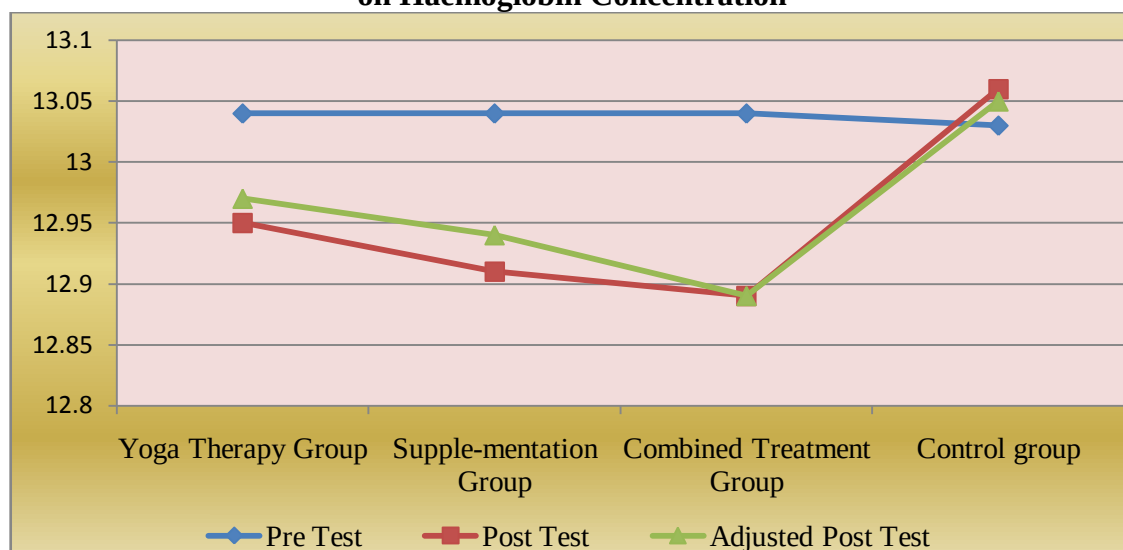
Table –II: Scheffe's Post Hoc Test for the Difference between Paired Means on Haemoglobin Concentration

S. No.	Adjusted Post-test Means				Mean Difference	Confidence Interval
	Yoga Therapy Group	Supplementation Group	Combined treatment Group	Control Group		
1.	12.97	12.94	-	-	0.03	0.05
2.	12.97	-	12.89	-	0.08*	0.05
3.	12.97	-	-	13.05	0.08*	0.05
4.	-	12.94	12.89	-	0.05*	0.05
5.	-	12.94	-	13.05	0.11*	0.05
6.	-	-	12.89	13.05	0.16*	0.05

**Significant at 0.05 level of confidence.*

Table-II shows that the adjusted post test mean difference between yoga therapy and combined treatment groups, yoga therapy and control groups, supplementation and combined treatment groups, supplementation and control groups, combined treatment and control groups, are 0.08, 0.08, 0.05, 0.11 and 0.16 respectively which are greater than the confidence interval value 0.05. However, the paired mean differences between yoga therapy and supplementation groups (0.03) is less than the confidence interval value 0.05 at .05 level. The results of the study documented that due to the effect of yoga therapy, supplementation and combined treatment the hemoglobin concentration of anaemic adolescent girls were significantly decreased however, combined Yoga therapy and supplementation of gooseberry with honey treatment was significantly better than isolated Yoga therapy and supplementation of gooseberry with honey treatment.

Figure –I: **Pre, Post and Adjusted Post-Test Mean Values of Yoga Therapy, Supplementation, Combined Treatment and Control Groups on Haemoglobin Concentration**



DISCUSSION

The result of the present study reported the beneficial effects of yoga therapy, supplementation of gooseberry with honey and combined of yoga therapy and supplementation of gooseberry with honey on Hemoglobin concentration. Although previous research in this area has not always produced consistent data, physical training is generally found to result in increased blood volume and total haemoglobin content. Most of the increase in blood volume reflects an increase in the amount of plasma rather than an actual rise in the red blood cell volume. The blood's haemoglobin concentration is therefore usually unchanged or slightly decreased after training. Both total blood volume and haemoglobin are important with respect to the oxygen transport system.

Haemoglobin is the red pigment of blood present inside the erythrocytes. The most characteristic property of haemoglobin is the case with which it combines with O_2 and dissociates from it. Haemoglobin is the chief participant in respiratory phenomenon as well as acid base homeostasis. The physiological importance of haemoglobin is due to its capacity to combine reversibly with O_2 , oxygen combines with haemoglobin to form oxyhaemoglobin readily at high partial pressure as existing in lungs. Oxygen is also readily released from oxyhaemoglobin at low O_2 pressure, as prevailing in the tissues. This property of haemoglobin provides an effective and excellent system for the transport of O_2 from the atmosphere (lungs) to the cells of the body (Ramarao, 1990).

Individuals who seek to boost physical performance rely on proper diet and increased training. The growing awareness of the synergy between diet and physical

activity has fueled an expanding interest in the valuable role that micronutrient can play in achieving one's genetic potential in physical performance. Recreational and competitive athletes seek reliable and practical information describing the role that micronutrients play in fostering performance because of dubious perceptions and misinformation in the public press. One impression is that most physically active individuals, as compared with their less active counterparts, fail to consume a diet that contains adequate amounts of vitamins and minerals, which leads to marginal nutrient deficiency and results in substandard training and impaired performance. Another perception is that physical activity promotes excessive losses of micronutrients because of increased catabolism and excretion. These opinions fuel the controversy for the use of vitamin and mineral supplements to improve physical performance, although scientific evidence to support the generalized use of nutritional supplements to augment work performance is lacking.

CONCLUSION

It is concluded that, due to the effect of yoga therapy, supplementation, combined treatment the hemoglobin concentration of anaemic adolescent girls was significantly decreased however, combined yoga therapy and supplementation of gooseberry with honey treatment was significantly better than isolated yoga therapy and supplementation of gooseberry with honey treatment. Exercise alone cannot be beneficial to the body. Proper exercise and balanced diet are the true basic necessities for a healthy human being. Fitness is a combination of heart and muscle capacity to use oxygen for energy production. Nutrition and well being hence assumes a vital role.

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