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Effect of Yogic Practices on the Health of School Children

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ABSTRACT

The study entitled "Effect of Yogic Practices on the health of School Children" has been done to the Students of Viswamangala English Medium High School, Mangalore University Campus, Mangalagangothri. For this purpose, 28 volunteer male subjects were selected randomly of the age group of 13-15 years were selected. A one month long practical session was conducted, with a total of 14 subjects treated as Experimental group and another 14 subjects were for control group. The Experimental group was given with selected yogic practices for one hour daily for 30 days. The session included a series of Āsanas, Prāṇāyāmas, Mudra and Relaxation techniques. The control group was not given any of these practices. The initial and final readings were taken for 2 groups by testing Lung Function Tests, by using a Digital Spirometer. Similarly Hemoglobin, Total count, Differential count, BP & weight were also measured. The results of various tests were analyzed through Paired t-test and have been compared for the 2 groups. After Yoga therapy, the experimental group showed a significant reduction in FVC at a level of significance p-value 0.03, FEV1 with a p-value of 0.007, with a p-value 0.04 for TC, p-value 0.004 for Neutrophil (N), Lymphocyte (L) with a p-value 0.0001, Monocyte (M) with a p-value 0.01 and p-value 0.008 for Weight (W). But there were no such significant result from the Control Group.

KEYWORDS :

INTRODUCTION:

Health is not a commodity to be purchased in the market. It has to be earned the hard way, by getting every cell in our body under our control. There is no magical elixir to maintain health nor is it needed.

The world around us is changing, environmental and ecological damage is widely prevalent atmospheric pollution leads to a host of maladies. So does contamination of our water resources, the quantity and quality of food available these days is much greater than before and children get into unhealthy eating habits. The social environment is also not conducive to good health in children. There are too many distractions and the mind is easily swayed movies, television and video games which kill the natural creativity of children, as well as the excessive pressure of schooling, can all have adverse effect in the child's mental and physical health.

Yogic practices contribute in improving the mental, physical and moral standards, as children are easily influenced. So, care must be taken to train them to think along correct lines for the attainment of health; make them realize that the body needs to be looked after. Healthy spiritual value must be taught from a tender age. Yogic practices are the key to health and the necessity to inculcate this awareness in children is very important. As young children are very impressionable and learn quickly from what goes on around them. Hence, if they are taught the basics of healthy living in all aspects of body and mind, they will carry this training into their teenage years where few of the teenage problems will be tackled efficiently, and further go on to become adults with well rounded personality.

REVIEW OF LITERATURE:

According to Susruta Samhita, Health indicates a normal condition of the three dosas, the digestive fire, Malas, and the seven dhatus of the body as well as a serene state of the body, mind and the sense-organs. The primary object of treatment is to maintain this healthy state of both body and mind in its normal equilibrium.[1]

Kumar N.[2] studied on effect of selected yogic practices and physical activity on hematological and physiological variables among college students. 90 male students of age group between 18 to 21years were selected as subjects at random from Sri Ramakrishna Mission Vidyalaya College, Coimbatore. They are divided into three equal groups; control, yoga group and physical activity group. The pre and post test scores were subjected to ANCOVA to find out the significant variables. Analysis revealed in group 2 and group 3, there is a significant increase in the hemoglobin level. But group 3 has shown high significance than group 2.

Pradyumna Singh Shekhvat and et.al.,[3] conducted a study to investigate the influence of Preksha Meditation on blood profile of adults. 40 healthy adults in the age group 25 to 30 years were selected on random basis and divided into two groups of 20 members each. Experimental groups have shown positive results on the blood profile after a course of 90 day preksha meditation intervention.

Sakthignanavel. D, et.al.,[4] conducted a study on Effective Analysis of Everyday and Alternative day Yogic Practice on Maximum Inspiration and Expiration Pressure of University Male Students. Total of 45 students were randomly selected from Pondicherry University for this study and divided into three groups 15 subjects each. Variables such as maximum inspiratory and expiratory pressure were determined at the beginning and after the ten weeks training programme. The subjects were administrated with ten weeks yogasanas, pranayama and relaxation practice program. The difference in the mean of each group for selected variable was tested for the significant of difference by using ANCOVA. The result showed that the everyday yoga practice group is significantly better than the alternate day yoga practice group and both the training groups revealed significant improvement on expiratory and inspiratory pressure than the control group.

Ghosh, S. K[5] conducted a study on the Effect of Physical Exercises, Yogic Practices and their Combined Training on Selected Physiological Variables among High School Boys. 60 subjects, age ranged from 13-15 years, were randomly divided into four groups of 15 numbers: physical exercise group, yogic practice group, combined group and

a control group. The experimental groups underwent twelve weeks treatment programme. Both pre-test and post-test were made for the collection of data. The data collection was made on the selected physiological variables, namely, pulse rate, respiratory rate, breath-holding time and mean arterial pressure. The result of analysis of covariance (ANCOVA) followed by the Scheffe's test showed significant decrease in all the groups except control group. Between combined group and yoga group, physical exercise group and yoga group a significant difference in paired adjusted final mean is seen. But there is no significant difference in pulse rate in combined group when compared with the physical exercise group.

Sridip Chatarji[6] made a study on the effect of twelve weeks of yogic training on general immunological health variables in a middle aged group.The convenient sampling method was applied. 45 untrained volunteers divided into control and experimental groups. Body weight, BMI, TC, DC and platelets were measured before and after the experimental interventions. The ANOVA test showed significant change in the variables of experimental group.

Thekeer Kuntal et.al.,[7] conducted a study on the effect of yogasanas on selected physical and psychological parameters of school boys, 100 school boys of Howrah District, West Bengal, were selected randomly as subjects for the present study. The age ranged from 10-12 yrs, were divided into two equal groups which is Gr. Y and Gr. C, Gr. Y was experimental group that practiced yogic asanas and Gr. C was Control group, flexibility. Body composition (such as BMI, % of body fat and IBM), School Attitude Inventory scale and self-concept, inventory scale were employed to all the subjects of both the groups and thereafter specific yogic treatment was given to Gr. Y for three days a week, continued one year, and finally the subjects were retested on criterion measures. The data were analyzed by t-ratio to find out the effect of the treatment. The result of the study showed that all the flexibility measures, body mass index, % of body fat, school attitude and self – concept were improved significantly among yogasana group but lean body mass was not improved significantly after one year yogic treatment.

Objectives of the study

- To find out the impact of selected yogic practices on Selected Parameters.
- It is hypothysed that "The Selected yogic practices will have a significant impact in the improvement of lung functioning, hemoglobin, total count, differential count, pulse pressure and weight in experimental group."
- In order to study the problem scientifically, the following Null Hypotheses has set. The selected practices will not showing any significant impact in the improvement of lung functioning, hemoglobin, total count, differential count, pulse pressure and weight in experimental group.

MATERIALS AND METHODS:

The present study was conducted to study the effect of selected yogic practices on selected parameters in children of the age between 13-15yrs students. There were 28 students to participate in the study, the students were divided randomly into two groups, 14 for Experimental and 14 Control group. Yogic practices were taught weekly 6 days for duration of one month to the Experimental Group. The parameters tested in before and after the study. This practical session included a standard sequence of selected Asanas, Pranayamas, Mudra and Relaxation Techniques. The control group was not given any of these practices. A Paired "t" test was employed in the study to analyze the significance of the result statistically.

Yogic Intervention:

The following Yogic practices were given to Experimental group over a period of one month.

List of yogic practices:

Svatikasana, Vajrasana, Supta-Vajrasana, Tadasana-I, Tadasana-II, Trikonasana, Parsvakonasana, Purvothanasana , Shavasan-I, Shavasana-II, Pavanamuktasana, Bhujangasana, Dhanurasana, Makarasana, Jansirshasana, Bharadwajasana, Viparitakarani, Uttanapadasan, Ujjayee, Bhastrika, Bahyakumbhaka, , Pasvottanasana, Prasarithapadottanasana, Shalabhasana, Anuloma-viloma,

PARAMETERS:

The following tools were used in the current study, case sheet conferring the semi structural schedule of socio - demographic variables such as age, sex, details on personal history, general and physical examination, test for Hemoglobin,Total count and Differential count, ESR, Digital Spirometer was done. Body Mass Index and B.P also measured.

RESULTS:

All the subjects under study were tested before and after 30days of yoga training which consisted of 60 minutes of practice in a day. The result shows an overall improvement in Total Count (TC), Neutrophil (N), Lymphocyte (L), Monocyte (M), FVC, FEV1, ERV and MVV in Experimental group, but not such significant improvement from the Control group. It shows that functioning of Lungs and overall health has improved in the Experimental group compared to the Control group.

A Paired "t" test was applied for each parameter and found out the value for each group viz, Experimental and Control. The results of "t" test are as follows. Level of significant selected is P≤0.05.

I. Results of Statistical Analysis of Experimental Group

S. No	Parameters	Mean		S.D		t-value	P- value	Significance
		Pre	Post	Pre	Post			
1	Hemoglobin (HB)	14.9143	14.8857	0.6455	1.6619	1.2856	0.1210	NS
2	Total Count (TC)	6821.42	8121.42	596.3718	898.25	-2.2173	0.0450	S
3	Neutrophil (N)	59.8571	42.8571	2.4133	13.6430	4.715	0.0040	S
4	Lymphocyte (L)	35.7857	45.5	2.9399	4.7626	-2.2048	0.0023	S
5	Monocyte (M)	1.2143	0.6429	0.4258	0.8419	2.8284	0.0142	S
6	Eosinophil (E)	3.1429	3.0857	1.1673	1.0144	0.0586	0.0653	NS
7	(ESR)	6.1429	5.5714	2.2823	2.0649	1.0965	0.2923	NS

II. Results of Statistical Analysis of Control Group

S. No	Parameters	Mean		S.D		t-value	P-value	Significance
		Pre	Post	Pre	Post			
1	Hemoglobin (HB)	15.1571	14.8857	0.4164	1.1915	0.7742	0.4526	NS
2	Total Count (TC)	6910.714	6792.857	316.3363	1085.899	0.3544	0.7287	NS
3	Neutrophil (N)	59.3257	56.2143	2.9724	8.5949	1.3913	0.1875	NS
4	Lymphocyte (L)	36.7143	39.1429	2.7296	6.3351	-1.6909	0.1147	NS
5	Monocyte (M)	1.1429	1	0.3631	0.7845	0.6183	0.547	NS
6	Eosinophil (E)	2.8571	2.9143	1.2924	1.3509	1.6045	1.7326	NS
7	(ESR)	7.8571	7.9286	1.7033	1.8273	1.9525	1.9838	NS

III. Results of Statistical Analysis of Experimental Group								
S. No	Parameters	Mean		S.D		t-value	P-value	Significance
		Pre	Post	Pre	Post			
1	Systolic BP	114.857	105.1429	6.9155	5.2456	4.0048	0.0015	S
2	Diastolic BP	71.5714	64.1429	5.6119	6.4909	3.4185	0.0046	S
3	Weight(KG)	44.9857	45.6857	8.7052	8.6499	-3.1067	0.0083	S

IV Results of Statistical Analysis of Control Group								
S. No	Parameters	Mean		S.D		t-value	P-value	Significance
		Pre	Post	Pre	Post			
1	Systolic BP	116.5714	110.4286	13.2067	7.3245	0.9169	0.3759	NS
2	Diastolic BP	65.2857	65.8571	8.7568	4.7370	-0.2035	0.8419	NS
3	Weight (KG)	50.95	51.4857	14.0089	14.2178	-1.0627	0.3073	NS

V Results of Statistical Analysis of Experimental Group								
S. No	Parameters	Mean		S. D		t-value	P-value	Significance
		Pre	Post	Pre	Post			
1	FVC	1.5779	2.0429	0.5772	0.5052	-2.2683	0.03201	S
2	FEV1	1.4043	2.0379	0.6501	0.4993	-2.8919	0.0079	S
3	FEV1/FVC	92.0643	99.7971	25.6347	0.4441	-1.1285	0.2795	NS
4	SVC	2.3057	2.5850	0.4669	0.4744	-1.57	0.1285	NS
5	ERV	0.7314	0.8193	0.2075	0.3831	-0.7544	0.4594	NS
6	IRV	0.725	0.7814	0.3896	0.3008	-0.429	0.6717	NS
7	MVV	64.2857	73.1429	15.0559	17.2139	-0.6195	0.5412	NS

S – Significant NS – Non-significant

VI Results of Statistical Analysis of Control Group								
S. No	Parameters	Mean		S. D		t-value	P-value	Significance
		Pre	Post	Pre	Post			
1	FVC	1.6336	1.835	0.4611	0.3866	-1.2526	0.2218	NS
2	FEV1	1.6236	1.8079	0.4633	0.3997	-1.1269	0.2703	NS
3	FEV1/FVC	99.3157	98.2886	0.9757	3.1598	1.1621	0.2628	NS
4	SVC	2.485	2.5607	0.5556	0.5808	-0.3525	0.7273	NS
5	ERV	0.8457	0.7479	0.5069	0.3578	0.5901	0.5608	NS
6	IRV	0.64	0.6607	0.3301	0.2811	-0.1788	0.8595	NS
7	MVV	65.0714	66.5	14.122	21.781	-0.2059	0.8387	NS

Discussion:

The various practices administered under the omnibus title yoga cover a wide spectrum. This is inevitable because yoga is not a system of medicine; it is a way of life, the implications of which go beyond health and diseases. When yoga is employed for prevention or management of disease some convenient and highly visible elements of yoga are used selectively. These practices have used yoga as a tool in mind-body medicine. This approach now has a strong foundation in psychoneuroimmunology, and is particularly relevant to a disorder of lung functions, which is characterized by deranged immune function.

The present study reveal that the concerned variables of lung function test and blood count test have been rationalized in terms of the hypotheses that the experimental groups will outperform the control group due to 30 days of yogic interventions. Pulse pressure is measured in millimeters of mercury (mmHg), the pressure difference between the systolic and diastolic pressures is the pressure change to create the pulse, which is the pulse pressure. If resting pulse pressure is 40 mmHg. Usually, the resting Pulse pressure in healthy adults, sitting position, is about 30-40(mmHg). The pulse pressure increases with exercise due to increased stroke volume, healthy values being up to pulse pressures of about 100 mmHg, simultaneously as total peripheral resistance drops during exercise. In this study, the pre pulse pressure mean is 43.2857 mmHg and that of post mean is 40.53 mmHg, it shows significant p-value < 0.05 in the experimental group. In the control group pre pulse pressure mean 51.2857 and in the post test it reduces to 48.5715 but it is above the normal range so it didn't statistically significant result. In children, it has shown a significant reduction in the pulse pressure after the yogic practices.

There are noticeable changes in the neutrophil count of the experimental group. Neutrophils defend against bacterial or fungal infection and other very small inflammatory processes that are usually first responders to microbial infection. They are very active in phagocytosing bacteria and are present in large amount in the pus of wounds. In experimental group of study, the neutrophil count reduced from pre-test mean is 59.8571 to post-test mean 42.8571 with significant p-value is 0.004, it shows the reduction of bacterial or fungal infections in the experimental group. But in control group the mean is from 59.3257 to 56.2143 at

p-value 0.1875 there is no such reduction.

The lymphocytes are the white cells which the body uses as the "soldiers' against illness, disease or infection. An increased level of lymphocytes would usually indicate that the body has experienced an influx or invasion of foreign cells, thereby prompting the lymphocytes to aggressively respond. In present case, there is a significant increase in the Lymphocyte count in both the groups in experimental group increased from 35.7857 to 45.5 with p-value 0.0023 and in control group it increases from 36.7143 to 39.1429 with p-value o.1147 but the increment is within the normal range.

Monocytes are common to the blood of all vertebrates and they help the immune system to function properly. There are a number of reasons for a high Monocyte count, which can also be called Monocytosis. Some of the reasons can include stress, viral fevers, inflammation and organ necrosis. Compromised blood supply and injuries and infection can be other causes for a high Monocyte count. In the present study, there was a significant reduction of monocyte count in the experimental group that is from 1.2143 to 0.6429 at p-value 0.0142 shows a significant reduction. In control group there is a reduction of monocyte count from 1.1429 to 1 at p-value0.1326 but it is not showing significant reduction.

The Erythrocyte Sedimentation Rate is being used as a screening test for wide variety of infections, inflammations and certain other pathological states. The tendency of the RBCs to settle down will increase when they form a coil. This coil formation increases when there is increase of plasma fibrinogen Ɣ-globulins. Most infectious antigens cause increase of Ɣ-globulins including fibrinogens. In the present case, ESR has decreased in the experimental group subjects from 6.1429 to 5.5714 with p-value 0.2287 and in control group also it decreases from 7.8571 to 6.4286 with p-value 0.0728. Hence the decreased value has not shown statistically significance value.

Eosinophils are part of the white blood cells that are responsible for fighting against infections or inflammations. Eosinophils increase in inflammatory conditions of the body, during certain infections by parasites or in certain skin diseases. In the present study, the Eosinophil count has decreased after the experimental intervention in the experimental group from 3.1429 to 3.0857 at p-value 0.0653. More than ten subjects in the experimental group had allergic symptoms. After one month, the experimental group subjects have decreased their symptoms, but statistically the result is no significant. In control also it did not show any significant value.

Hemoglobin count has decreased in the both the groups. In experimental group it is from 14.9143 to 14.1857 at p-value 0.221 and in the control group it decreases from 15.1571 to 14.8857 at p-value 0.4526, but the count obtained within the normal range i.e. 14 - 18 gms/dl. Hence there is no significance for the reduction of Hemoglobin counts.

White blood cells, fight against infections in a process known as 'phagocytosis' where they surround the foreign organisms and destroy it. White blood cells also help in production, transportation and distribution of antibodies in order to build the **body's immune system**. A normal white blood cell count is between 4,500 and 11,000 cell per microliter. Present study has shown increased value of WBC counts which is statistically significant in experimental group from 6821.4290 to 8121.4290 at p-value 0.0450 here the increment is within the normal range but in control group the WBC count decreases from 6910.714 to 6792.857 at p-value 0.7287. Hence clinically it has no significance.

In lung function test parameters, there is significant improvement at a level of significance $p \leq 0.05$ in Forced Vital Capacity (FVC) from 1.5779% to 2.0429% with a significant p-value 0.0320, for Forced Expiratory Volume in one second (FEV_1) from 1.4043% to 2.0379% with a significant p-value 0.0079, for FEV_1/FVC from 92.0643% to 99.7971%, Slow Vital Capacity (SVC) from 2.3057% to 2.5850%, Expiratory Reserve Volume (ERV) from 0.7314% to 0.8193%, Inspiratory Reserve Volume (IRV) from 0.725% to 0.7814%, and Maximum Voluntary Ventilation (MVV) from 64.2857% to 73.1429%, have shown increased values from pre to post test in experimental group, there is no such improvement in control group. In experimental group only Forced Vital Capacity increased from 1.5779% to 2.0429% and show significant p-value 0.0320, in control group it increased from 1.6336 to 1.835 but it not statistically significant, Forced Expiratory Volume show significant result in experimental group from 1.4043% to 2.0379% , it didn't show such statistically significance in control group from 1.6236 to 1.8079 with p-value 0.2703. This result shows the effect of yoga which helped the children to develop their health.

Conclusion:

Based on the outcome of the study we can conclude - The study on the effect of selected yogic practices on selected parameters in the subjects of school children has shown positive result. Yoga has the potentiality to improve selected parameters and helps in the maintenance of health. Practices of yoga will work efficiently to improve the functioning of lungs. Yoga can work as a therapeutic tool for the disorders of the lungs. Selected Yogic Practices administered in a more controlled set up under strict vigilance can yield better results. Increased number of subjects, longer duration for the study will increase the result.

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