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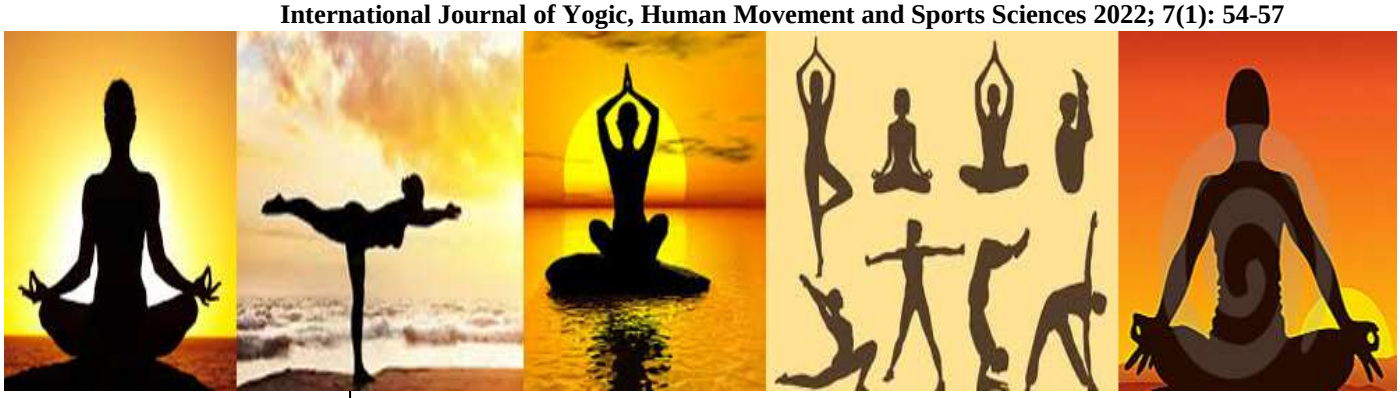

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Effect of Kapalbhati ventilatory functions of football players

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Abstract
The present study was conducted to investigate the effect of Kapalbhati on Ventilatory functions of football players. Twenty male football players between the age group of 18-25 were selected through purposive random sampling technique from Gobindgarh Public College, Alour (Khanna). Experimental design was applied in which the subjects were pre-test and post-test. Subjects were divided into two groups i.e. experimental and control group. Training of Kapalbhati was imparted up to Eight weeks and subjects were post tested. Training program was not given to control group. Inspiratory reserve volume, Vital capacity and Tidal volume were measured by Spiro meter test. The results of the investigation showed significant improvement in all three variables which was tested on .01 level of confidence.

Keywords: Kapalbhati, football players, ventilatory functions

Introduction
Yoga was invented in India about five thousand years ago. Yoga is a scientific technique for development of the art of living which ultimately grows in to a way of life. Yoga is scientific because the result of its practice can be predicted and are not only experience but can also be measured. It is the science for higher life forces. India has a glorious heritage of methodical practices which trigger the higher life forces. For thousands of years this heritage has been used for the welfare of mankind. In the dazzling advanced age of technology, however this heritage of triggering the higher life forces has been weakened so much, that have almost forgot this discovery by Indian yogi. In the present modern age, yoga is much required than ever because; technology has given rise to certain new types of physical ailments. Such as nervous, tension, stress, insomnia, different types of allergies, mental illness such as constant cravings, mental instability and so on. So it is the stage where, individual makes the use of our higher life forces to get rid of these maladies.

Yoga is the requirement to integrate with today's lifestyle. The two major challenge of this era of science and technology *viz.* Stress and pollution becomes the true trigger of the new revolution. A report of Nasa (2011) state that India has been ranked as 7th most environmentally hazardous country in the world by new ranking. India's per capita carbon dioxide emissions were roughly 3,000 pounds (1,360 kilograms) in 2007, according to the study. That's small compared to China and the U.S., with 10,500 pounds (4,763 kilograms) and 42,500 pounds (19,278 kilograms) respectively that year. The study said that the European Union and Russia also have more emissions than India. The World Health Organization estimates that about two million people die prematurely every year as a result of air pollution, while many more suffer from breathing ailments, heart disease, lung infections and even cancer. Fine particles or microscopic dust from coal or wood fires and unfiltered diesel engines are rated as one of the most lethal forms or air pollution caused by industry, transport, household heating, cooking and ageing coal or oil-fired power stations. If pollution is working at the material front to direct man towards better ecological and appropriate technology the challenge of stress is shaking the very foundation of the matter based objective approach of science.

The process of Kapalbhati is related to the breathing process; however it is not a type of pranayam. But, certain sadhakas think in this manner and study Kapalbhati under the impression that they are studying a type of pranayam.

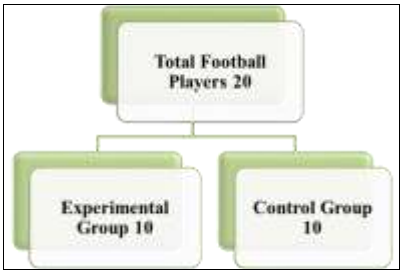
However, process of cleaning the wind pipe is one of the shuddhikriyas. The word Kapalbhati is made up of two words, Kapal meaning skull (here skull includes all the organs under the skull too) and Bhati means shining, illuminating. Due to the process, the organs under the skull mainly the brain and the small brain are influenced in a good manner. Hence the word is used in that way. It is the best exercise to stimulate every tissue of the body. After and during the practice, a peculiar vibration and joy is felt, especially in the spinal centers. Kapalabhati's powerful exhalations expand the volume of air passing in and out of the lungs, increasing the flow of blood in the lung tissue itself, as well as throughout the body. This is an effective combination for expelling volatile wastes.

When waste levels decrease, the body tissues release additional waste into the blood. Clearing waste through the lungs reduces the burden on other routes of elimination, such as the skin, liver, colon, and kidneys. If Kapalabhati is continued long enough, this cleansing affects all tissues. There is also evidence that the vigorous exhalations eliminate more carbon dioxide than is eliminated during normal respiration.

Method and Procedure

The selection of method and procedure for the research study depends upon the type and scope of the problem. The investigator has to study the nature of problem before finalizing the research methodology for it. For that research needs planning and utilization of application of appropriate research design. It is the path which is followed by the research to reach the target, in simple language; a research design is stated as a plan of action, a plan of collecting and analyzing data in an efficient manner. The ultimate success of a research work greatly depends upon the design of the study; it avoids aimless wandering, save times and economizes the efforts of researcher.

Sampling size: The sample was divided in following way:



The present study is an experimental study. The investigator has selected twenty inter college level football player of Gobindgarh Public College, Alour (Khanna). The entire twenty subjects were ranging in age group of 18-25 years. In this study, simple random sampling technique was used for the collecting data.

Experimental Design: The present study was an experimental, which states to know the effects of Kapalbhati on ventilator function of football players. Pre-test and post-test was conducted to find out the effects of the Kapalbhati. The twenty subjects were divided in to two groups namely experimental group and control group. There were ten subjects in each group. Pre-test was conducted on both groups before imparting the training of Kapalbhati to the subjects. After pre-test the experimental treatment of Kapalbhati was given to the subjects of experimental group for eight weeks. Training was five days in a week. After that post-test was taken on both groups. No experiment treatment was given to control group. The effect of Kapalbhati training was analyzed on inspiratory reserve volume, vital capacity and tidal volume of the subjects.

Tool: For the data collection spirometer was used.

Statistical Technique: In order to find out the effect of Kapalbhati on experimental group and control group 't' test was used for calculation of data.

Results

Table 1: Pre-test and Post-test score of experimental and control group Inspratory Reserve Volume

Group	Data	Number	Mean	S.D.	df	't' Value
Experimental	Pre-test	10	3.99	0.511	9	4.67 *
	Post-test	10	4.18	0.520		
Control	Pre-test	10	3.94	0.670	9	1.81
	Post-test	10	3.98	0.673		

* Significant value at .01 level=2.88

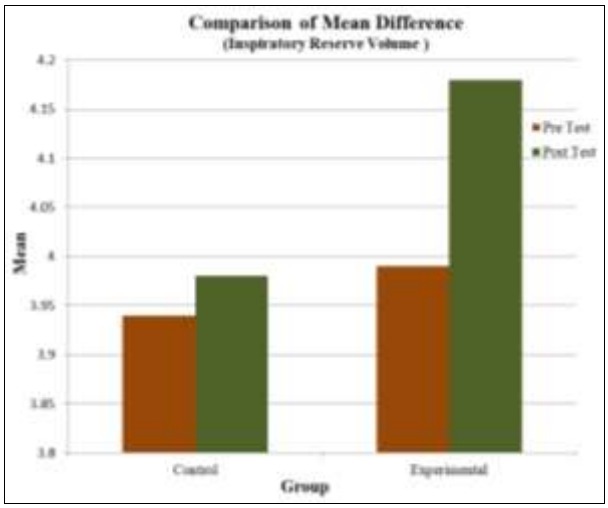


Fig 1: Comparison of mean difference between experimental and control group of Inspiratory Reserve Volume

Table 1 show the comparison of pre-test and post-test score of experimental and control group respectively. Where the mean score of pre-test and post-test of experimental group is 3.99 and 4.18 and standard deviation is 0.511 and 0.520. The t-value 4.67 is found to be significant at .01 level of confidence which shows that the Inspiratory reserve volume of experimental group after the training eight week of Kapalbhati is slightly higher than the pre test of the same group. The table further shows the comparison of pre and post test score of control group. Where the mean score of pre-test and post-test of control group is 3.94 and 3.98 and standard deviation is 0.670 and 0.673. The 't' value 1.81 is found to be not significant at any level of confidence. As the experimental treatment showed significant effect on the subjects.

Table 2: Pre-test and Post-test score of experimental and control group Vital Capacity

Group	Data	Number	Mean	S.D.	df	't' Value
Experimental	Pre-test	10	4.66	0.810	9	3.77 *
	Post-test	10	4.80	0.801		
Control	Pre-test	10	4.45	0.715	9	1.94
	Post-test	10	4.55	0.696		

* Significant value at .01 level=2.88

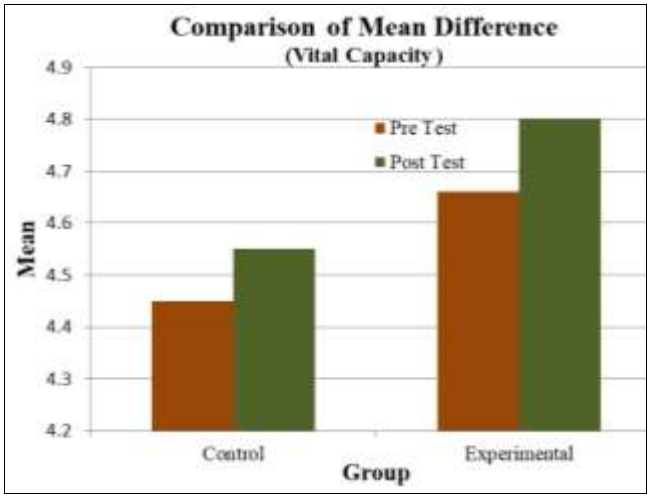


Fig 2: Comparison of mean difference between experimental and control group of Vital Capacity

Table 2 show the comparison of pre-test and post-test score of experimental and control group respectively. Where the mean score of pre-test and post-test of experimental group is 4.66 and 4.80 and standard deviation is 0.810 and 0.801. The 't' value 3.77 is found to be significant at 0.01 level of confidence which shows that the Vital Capacity of experimental group after the training 08 week of Kapalbhati is slightly higher than the pre test of the same group. The table further shows the comparison of pre-test and post-test score of control group. Where the mean score of pre-test and post-test of control group is 4.45 and 4.55 and standard deviation is 0.715 and 0.696.The t value 1.94 is found to be not significant at any level of confidence. Experimental group performed better on the variable vital capacity.

Table 3: Pre-test and Post-test score of experimental and control group Tidal Volume

Group	Data	Number	Mean	S.D.	df	't' Value
Experimental	Pre-test	10	0.325	0.121	9	4.33*
	Post-test	10	0.390	0.122		
Control	Pre-test	10	0.350	9.71	9	1.08
	Post-test	10	0.370	7.52		

* Significant value at 0.01 level=2.88

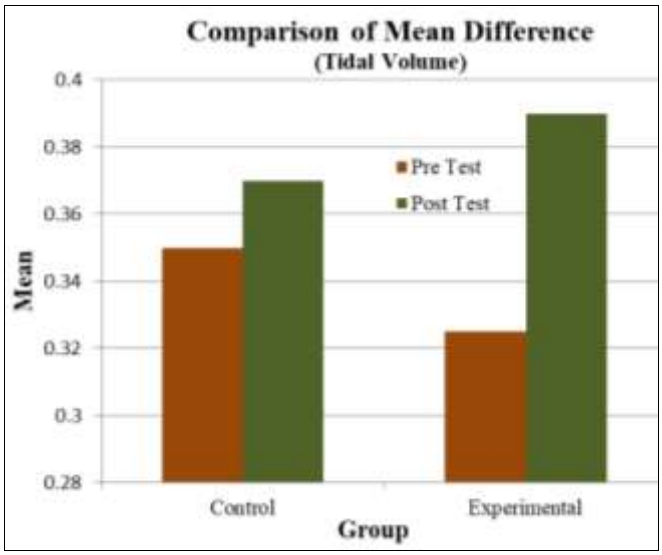


Fig 3: Comparison of mean difference between experimental and control group of Tidal Volume

Table-3 show the comparison of pre and post test score of experimental and control group respectively. Where the mean score of pre and post test of experimental group is 0.325 and 0.390 and standard deviation is 0.121 and 0.122. The t value 4.33 is found to be significant at 0.01 level of confidence which shows that the Tidal Volume of experimental group after the training 10 week of Kapalbhati is slightly higher than the pre test of the same group.

The table further shows the comparison of pre and post test score of control group. Where the mean score of pre and post test of control group is 0.350 and 0.370 and standard deviation is 9.71 and 7.52. The t value 1.08 is found to be not significant at any level of confidence. Experimental group performed better on the variable vital capacity.

Conclusion

- Significant difference was observed between exprimental and Control Groups on the variable inspiratory researve volume. Exprimental group performed better in comparision of Control group.
- Treatment of Kapalbhati indicate increase in vital capacity. When t Test was applied on both group, Exprimental group showed significant improvement in comparison to Control group on the variable vital capacity.
- Significant change was also observed on the variable Tidal Volume. Exrimental group performemed better on the physiological variable Vital capacity due to the training of Kapalbhati.

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