

# A study on the influence of asanas and pranayama on vital capacity of school going children

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■ ABSTRACT

The purpose of the study was to determine the effect of selected Asanas and Pranayama on vital capacity of school going children. One hundred twenty (120) subjects were randomly selected and equally assigned to the four groups by using random sampling procedure *i.e.* three experimental groups and one control group. The experimental group A was administered Asanas, group B was administered Pranayama and group C was administered combination of Asana, Pranayama and group D was considered as control group and no training was given for a period of twelve weeks. Analysis of covariance was used exclusively to compare the effect of three yogic experimental treatments programme for school going children. After statistical analysis, findings showed significant effect of all the three experimental groups.

■ **Key Words** : Asana, Pranayama, Vital capacity

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Yoga is the science of right living and, as such, is intended to be incorporated in daily life. It works on all aspects of the person: the physical, vital, mental, emotional, psychic and spiritual. The word "Yoga" means 'unity' or 'oneness' and is derived from the Sanskrit word Yuj which means 'to join'. This unity or joining is described in spiritual terms as the union of the individual consciousness with the universal consciousness. On a more practical level, Yoga is a means of balancing and harmonizing the body, mind and emotions. This is done through the practice of Asana, Pranayama, Mudra, Bandha, Shatkarma and meditation and must be achieved before union can take place with the higher reality. The application of yogic techniques is considered beneficial for health and cure of certain diseases for vital capacity management and for improving general efficiency of individual in different fields, Yoga is being utilized from the most fundamentally personal to the social and educational implication of the society as a whole. No matter how times and life styles change the judgment of the ancient sages in

matters relating to life and conduct is still relevant. Even though our attitude to the nature of Yoga itself may be different from those who were instalment. In its evolution, its wisdom is applied. It is also a spiritual pursuit for many seekers of truth. In the modern world, western countries like America use Yoga as a tool for mental, physical and spiritual upliftment.

**Objectives of the study:**

- To study the effect of Asanas on vital capacity of school going children.
- To study the effect of Pranayama on vital capacity of school going children.
- To study the combination effect of Asana Pranayama on vital capacity of school going children.
- To compare the effect of Asanas and Pranayama and their combination on vital capacity of school going children.
- To compare the three treatments and their effect on the vital capacity level.

**Hypotheses:**

- H<sub>1</sub> There will be significant effect of Asanas practice on vital capacity of school going children.
- H<sub>2</sub> There will be significant effect of Pranayama practice on vital capacity of school going children.
- H<sub>3</sub> There will be significant effect of Asana Pranayama practice on vital capacity of school going children.
- H<sub>4</sub> There will not be any significant difference between three treatment groups.

**Selection of subjects:**

One hundred twenty (120) school going boys were selected randomly as subjects in the age group of 8-10 years from Muni International School, A-2/16-18, Mohan Garden, Uttam Nagar, New Delhi-110059, India. The subjects were divided into three treatment groups and one control group using random method. Group A was allotted Asanas treatment group consisted of 30 subjects, Group B was allotted Pranayama treatment group consisted of 30 subjects, Group C was allotted combination of Asana Pranayama treatment group consisted of 30 subjects and Group D control group consisted of 30 subjects. The study was confined to 12 weeks of training programme.

**Experimental protocol:**

Experimental population of 90 subjects were assembled in Activity Hall at Muni International School, A-2/16-18, Mohan Garden, Uttam Nagar, New Delhi-110059, India. Experimental training was executed from 9:00 AM onwards for 45 minutes, for six days a week and Sunday has been observed as weekly off. Each subject of the experimental group was ready to learn Asanas and Pranayamas. Group 'A' acted as Asanas Group, 'B' acted as Pranayama group, Group 'C' acted as Combination of Asana and Pranayama group and

Group 'D' acted as control group which did not participate in the training programme. The subjects of experimental group 'A' practised Asana (Surya Namaskar, Sarvangasana, Matsyasana, Halasana, Bhujangasana, Shalvhasana, Dhanurasana, Chakrasana, Ardha Matsyendrasana, Paschimottanasana, Vajrasana, Yogamudra, Standing Katichakrasana, Tadasana and Shavasana) and group 'B' practised Pranayama (Anuloma Vilom and Bhastrika) and group 'C' practised combination of Asana and Pranayama (Surya Namaskar, Sarvangasana, Matsyasana, Halasana, Bhujangasana, Shalvhasana, Dhanurasana, Chakrasana, Ardha Matsyendrasana, Paschimottanasana, Vajrasana, Yogamudra, Standing Katichakrasana, Tadasana, Shavasana, Anuloma Vilom Pranayama and Bhastrika Pranayama).

**Tool used:**

Vital capacity was obtained to the nearest C.C. with the help of dry Spirometer.

**■ OBSERVATIONS AND DISCUSSION**

Table 1 indicates the values of descriptive statistics of the experimental groups (Asanas group, Pranayama group, Asana Pranayama group) and control group for physiological variable of vital capacity, which shows that the mean and S.D. values of Asanas group, Pranayama group, Asana Pranayama group and the control group were found to be 1480.00 ± 234.00, 1501.66 ± 222.24, 1415.00 ± 258.026 and 1390.00 ± 268.90, respectively. For the total subject the mean and S.D. was 1446.66 ± 247.65.

The mean and standard error of different post-testing groups after adjustment have been shown in Table 2, which were for Asanas group 1447 and 26.70, Pranayama group 1535 and 26.70, Asana Pranayama group 1459 and 26.77 and control group 1346 and 26.78.

Treatment group	Mean	Std. deviation	N
Asanas group	1480.00	234.00	30
Pranayama group	1501.66	222.24	30
Asana pranayama group	1415.00	258.02	30
Control group	1390.00	268.90	30
Total	1446.66	247.65	120

Treatment group	Mean	Std. error	Confidence interval	
			Lower bound	Upper bound
Asanas group	1447 <sup>a</sup>	26.70	1394.54	1500.33
Pranayama group	1535 <sup>a</sup>	26.70	1481.97	1587.77
Asana pranayama group	1459 <sup>a</sup>	26.77	1405.48	1511.55
Control group	1346 <sup>a</sup>	26.78	1292.78	1398.88

(a) Covariates appearing in the model are evaluated at the following, values: general vital capacity scale for children pre test = 1317.91

Table 3 indicates the values test of difference between the subject effects, which shows that there was a significant difference in pre-test values of physiological variable of vital capacity for the four selected groups, as the value was found to be 203.56, which proved to be the base of analysis of covariance. Also, a significant difference was found between the post-test values of the experimental and control group as the value was found to be 8.33, which was significant at 0.05 level.

Table 4 indicates the values of post hoc test for the selected groups for physiological variable of vital capacity, which shows that a significant difference was found between the post-test values of Asanas group and the control group as the value was found to be 101.60 which was significant at 0.05 level, the post-test values of Pranayama group and the control group as the value was found to be 189.03 which was significant at 0.05 level, Asana Pranayama group and the control group as the value was found to be 112.68 which was significant at 0.05 level, also a significant difference was found between the post-test values of Asanas group and Pranayama group as the value was found to be 87.43, which was significant at 0.05 level, a significant difference was found between the post-test values of Pranayama group and Asana Pranayama group as the value was found to be 76.35, which was significant at 0.05 level.

**Interpretation of findings:**

The values of the means and standard deviations for the data on vital capacity in the different groups during the post-testing is shown in the Table 1. Further, adjusted means and standard deviation for the data on vital capacity of different groups during post-testing have been shown in Table 2. This may be noted that these values were different from that of the unadjusted values shown in Table 1. The advantage of using the ANCOVA is that the differences in the post-testing means are compensated for the initial difference in the scores. In other words, it may be said that the effect of covariate is eliminated in comparing the effectiveness of the treatment groups during post-test. Table 3 shows the F – value for comparing the adjusted means of the four treatment groups (Asanas group, Pranayama group, Asana Parnayama group and Control group) during post-testing. Since p-value for the F- statistic was 0.00 which was less than 0.05, so it is significant. Thus, the Null hypothesis of no difference among the adjusted post-means for the data on vital capacity in four treatment groups may be rejected at 5 per cent level. Since F-statistic was significant, post hoc comparison has been made for the adjusted means of the four treatment groups which is shown in Table 4. It may be noted here that p-value for the mean difference between Asanas group and control group was 0.008, Pranayama group and control group was 0.00, Asana Pranayama group and control group was 0.004,

**Table 3: ANCOVA table for post-test data on vital capacity**

Source	Sum of squares	DF	Mean square	F	Sig. (p-value)
Pre-vital capacity scale for children	4324564.69	1	4324564.69	203.56	0.00
Treatment group	530990.25	3	176996.75	8.33	0.00
Error	2443111.71	115	21244.45		
Corrected total	7298666.66	119			

**Table 4 : Post hoc comparison for the group means in post- measurement adjusted with initial differences vital capacity**

(I) Treatment group	(J) Treatment group	Mean difference (I-J)	Sig. <sup>a</sup> (p-value)
Asanas group	Pranayama group	-87.43*	0.02
	Asana pranayama group	-11.08	0.77
	Control group	101.60*	0.008
Pranayama group	Asanas group	87.43*	0.02
	Asana pranayama group	76.35*	0.04
	Control group	189.03*	0.00
Asana pranayama group	Asanas group	11.08	0.77
	Pranayama group	-76.35*	0.04
	Control group	112.68*	0.004
Control group	Asanas group	-101.60*	0.008
	Pranayama group	-189.03*	0.00
	Asana pranayama group	-112.68*	0.004

Based on estimated marginal means, (a) Adjustment for multiple, comparisons: Least significant difference (equivalent to no adjustments), \* indicate significance of value at P=0.05

Asanas group and Pranayama group was 0.02 and Pranayama group and Asana Pranayama group was 0.04 and all these p-values were less than 0.05 and hence, they were significant at 5 per cent level. Thus, the following conclusions can be drawn:

There was a significant difference between the adjusted means of the Asanas group and control group on the data of physiological variable vital capacity during post-test.

There was a significant difference between the adjusted means of the Pranayama group and control group on the data of physiological variable vital capacity during post-test.

There was a significant difference between the adjusted means of the Asana Pranayama group and control group on the data of physiological variable vital capacity during post-test.

There was a significant difference between the adjusted means of the Asanas group and Pranayama group on the data of physiological variable vital capacity during post-test.

There was a significant difference between the adjusted means of the Pranayama group and Asana Pranayama group on the data of physiological variable vital capacity during post-test.

In order to find as to which treatment is best, one can see the adjusted means values of different treatment groups during post-testing given in Table 2. Clubbing these adjusted means with the five conclusions mentioned above. Hence, it may be inferred that Asanas, Pranayama and Asana Pranayama are equally effective in increasing the vital capacity among the subjects in comparison to that of the control group. To control vital capacity all the treatments proved to be effective as among all the groups after treatment vital capacity has shown upwards trends but Pranayama was most effective as difference between pre and post-test was 226.66, for experimental group which induces Asana Pranayama together difference between pre and post-test was 153.33 in case of experimental group which was under gone Asanas training was less effective. Still difference between pre and post-test was 120. Which can be seen clearly in graphical representation that is Fig.1.

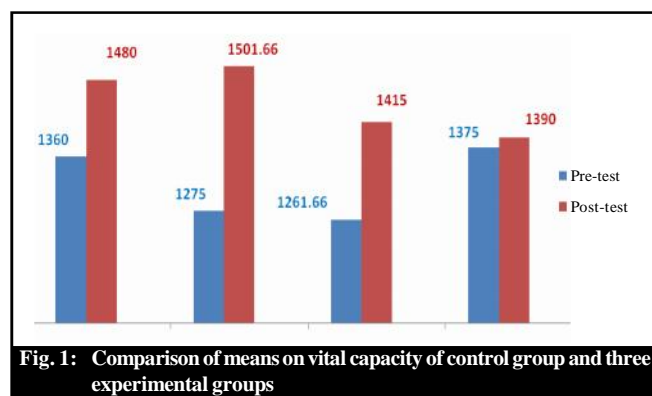


Fig. 1: Comparison of means on vital capacity of control group and three experimental groups

Table 3 was referred back into the result section. It could be seen from the table that there was a significant difference in case of vital capacity after administrating the different training programme namely, Asana, Pranayama and combination of Asana Pranayama. The post hoc test (Table 4) revealed that vital capacity was significantly improved in Pranayama among the three experimental programmes followed by Asana Pranayama programme and Asanas programme groups. The effectiveness of Pranayama to other training programme may be due to the reason that Pranayama related to the breathing exercises so it will have significant effects on the lungs volume of an individual. Therefore, proposed hypothesis has been accepted in case of vital capacity. The above findings of the present study are in conformity with the findings of Alvarez (1993) conducted studies on vital capacity responses of high school students. Kumari (2005) made investigation on impact of Yogic shatkriyas and Pranayamas on vital capacity of senior secondary student. Similarly Flocco (2005) also made some observations on students perception of vital capacity. Asha (2003) submitted some results on creativity, intelligence, academic vital capacity and mental health.

### Conclusion:

Significant improvement was found in vital capacity performance as a result of the experimental treatment in all the three experimental groups.

### Recommendation:

It will be appreciated if the following studies may be executed in future for upliftment of humenbeings like:

- Sportsmen from different games and sports.
- Boys of different age groups (childhood, college going).
- Girls of different groups (childhood, adolescent and college going).
- Working and non-working males and females from different walks of life.
- Senior citizens male and female.
- It is further noted that the same research may be conducted on larger population of different age groups and genders.

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