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## Effect of Ujjayi pranayama on selected physiological variables on school girls of Chandigarh

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### Abstract

The objective of the study was to find the effect of six week Ujjayi pranayama training on physiological variables among school students, for the purpose of the study, twenty-four (24) school girls from Government High School Sarangpur, Chandigarh was selected. The age of the subject range between 14-15 years, total numbers of subjects were divided into two group's i.e. experimental group (12) and control group (12). Experimental group was given Ujjayi Pranayama and control group was not given any kind of training. The training programmed was scheduled for 6 weeks by the researcher. It was 45 minutes pranayama training for 5 days in a week. All groups were pre and post tested on physiological variables (vital capacity, systolic blood pressure, diastolic blood pressure, breath hold capacity, resting pulse rate and respiratory rate). The data was analyzed by employing pair 't'-test. The level of significance was set at 0.05. Statistical on gathered data showed that there were significant differences found on vital capacity, breath hold capacity, resting pulse rate and respiratory rate. The control group showed no significant differences found on physiological variables.

**Keywords:** Anulom Vilom Pranayama, Vital Capacity, Blood Pressure, Resting Pulse Rate, Breath Hold Capacity

### Introduction

Girls are essential part of our society. In India the girls faces different difficult situation in their lives. They not only handle the pressure of society but also some physical changes. In the age of puberty many psychological and physical changes occurs in the body of girls. Due to these changes the girls take more stress and pressure in their mind. Practice of yoga and pranayama bring a great modification in their life (Plowman & Denise, 2008).

Pranayama gives a great effect on our health. It is a kind of exercises which gives strength to our respiratory organ and makes our internal body system fit and healthy. It consist frequent inhalation and exhalation of breathing exercise. Pranayama should be performed in a sitting posture like Sidhasana and Padmasana. Inhalation in pranayama called *Purka* which means "the act of filling" and exhalation is *Rechaka* means the "act of emptying". Retention called *Kumbhaka* means "hold" (Joshi, 1992).

Ujjayi a "psychic breath" is a kind of pranayama. It is a loud breath exercise. The word "Ujjayi" means "victory". This exercise calms our mind and leads to success in meditation. That why we give the name of psychic breath. In this exercise we inhale and exhale air through our both nostril smoothly and effortlessly. There should be no pressure given our chest while performing this exercise. Loud sound should be come from our throat but this sound should be soft and only audible to the practitioner. The loud and rough sound shows much effort and more pressure on our chest. This exercise helps us to release stress, depression and from our life (Gharote, 1990) [7]. It is an essential part of many techniques and is performed with asanas, mantra japa, ajapa japa, kriya yoga and prana vidya (Saraswati, 2005).

Ujjayi Pranayama is a simple exercise in which the person inhale and exhale the air through his nostril with a soft sound comes from his throat. It keeps our mind calm and smooths the nervous system of our body. It is useful for the patient of insomnia. This exercise reduces our heart rate and also helps the patient of high blood pressure. Ujjayi Pranayama removes the disorder of blood, bone, fat, semen, flesh, skin, and marrow.

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Best for arousing kundalini and meditation, it increase the concentration power (Sarvyoga, 2015).

**Objective of the study**

To draw out the effect of Ujjayi Pranayama on selected physiological variables (vital capacity, systolic blood pressure, diastolic blood pressure, breath hold capacity, resting pulse rate, respiratory rate) among school girls.

**Method and procedure**

For this experimental study, we study about pre and post experimental design. For this, purposive sampling technique

was adopted. For the purpose of the study twenty four (24) school girls from Government High School Sarangpur, Chandigarh was selected, divided into two groups' i.e. experimental group (12) and control group (12). The age of the students ranged from 14 to 15 years. The training programmed was scheduled for six weeks, 45 minutes pranayama training for 5 days in a week. Experimental group were given a warm up session, in which the groups use to perform pre-yogic and yogic breathing exercise.

**Criterion measures**

Variable	Test/Tool	Unit
Vital Capacity	Peak Flow Meter	Liter
Systolic Blood Pressure	Sphygmomanometer, Stethoscope	mmhg
Diastolic Blood Pressure	Sphygmomanometer, Stethoscope	mmhg
Breath Hold Capacity	Stop Watch	breath hold/min
Resting Pulse Rate	Stop Watch	Beats/min
Respiratory Rate	Stop Watch	Breath/min



**Fig 1:** Illustration of Performing Ujjayi Training



**Fig 2:** Illustrations of Measuring Peak Flow Meter, Blood Pressure and Respiratory Rate

**Results and findings**

The data was analyzed by employing pair 't'-test. The comparison of initial and final scores on physiological variables (vital capacity, systolic blood pressure, diastolic

blood pressure, breath hold capacity, resting pulse rate and respiratory rate) for experimental (Ujjayi training) group is presented in table-1.

**Table 1:** Comparison of pretest and post test scores for Ujjayi group on physiological variables among school girls

Variable	Test	N	Mean	SD	SE	MD	't'
Vital Capacity	Pre-Test	12	328.33	27.90	8.05	49.16	4.845*
	Post-Test	12	377.50	21.37	6.16		
Systolic Blood Pressure	Pre-Test	12	122.75	27.87	8.04	15.75	1.868
	Post-Test	12	107.00	8.71	2.51		
Diastolic Blood Pressure	Pre-Test	12	71.41	11.12	3.21	.833	.221
	Post-Test	12	70.58	6.86	1.98		

Breath Hold Capacity	Pre-Test	12	38.33	16.18	4.67	26.83	3.544*
	Post-Test	12	65.16	20.63	5.95		
Resting Pulse Rate	Pre-Test	12	101.75	17.94	5.18	21.166	3.667*
	Post-Test	12	80.58	8.82	2.54		
Respiratory Rate	Pre-Test	12	23.16	5.65	1.63	11.66	5.534*
	Post-Test	12	11.50	4.62	1.33		

\*Significant at 0.05 level, 'F'  $_{0.05(22)} = 2.074$

The comparison of pre-test score and post-test score on physiological variables (vital capacity, systolic blood pressure, diastolic blood pressure, breath hold capacity,

resting pulse rate and respiratory rate) for control group is presented in table-2.

**Table 2:** Comparison of pretest and post test scores for control group on selected physiological variables of school girls

Variable	Group	N	Mean	SD	SE	MD	't'
Vital Capacity	Pre-Test	12	291.66	31.57	9.11	23.33	1.984
	Post-Test	12	315.00	25.76	7.43		
Systolic Blood Pressure	Pre-Test	12	118.41	7.166	2.068	.08	.033
	Post-Test	12	118.33	4.886	1.410		
Diastolic Blood Pressure	Pre-Test	12	67.83	8.06	2.32	2.50	.856
	Post-Test	12	70.33	6.11	1.76		
Breath Hold Capacity	Pre-Test	12	28.66	6.94	2.00	4.75	1.728
	Post-Test	12	33.41	6.51	1.88		
Resting Pulse Rate	Pre-Test	12	96.75	13.18	3.80	8.08	1.411
	Post-Test	12	88.66	14.83	4.28		
Respiratory Rate	Pre-Test	12	19.58	5.71	1.64	1.75	.715
	Post-Test	12	17.83	6.26	1.80		

\*Significant at 0.05 level, 't'  $_{0.05(22)} = 2.074$

With regard to pre-test and post-test scores for Ujjayi training group on selected Physiological variables (vital capacity, systolic blood pressure, diastolic blood pressure, breath hold capacity, resting pulse rate, respiratory rate) among school girls, it is found statistically significant on vital capacity, breath hold capacity, resting pulse rate, respiratory rate with *p-value* .000, .002, .001 and .000 respectively at .05 level of significant. In case of systolic blood pressure and diastolic blood pressure no significance were found it might be because of short training period. It is clear that Ujjayi training improve Vital Capacity resulting in more stronger respiratory muscles, make much easier for the diaphragm to move the abdominal contents and help decreasing in airway resistance by regulating sympathetic stimulation bring about bronchodilation by bronchiolar smooth muscles were Singh (2015), Abharam (2014), Bal (2010) <sup>[1]</sup>, and Sawant (2012) also showed significantly increase Vital Capacity and supported the present study. Ujjayi training developed the maximum Breath Hold Capacity as compare to Control group, Singh (2013), Bal (2010) <sup>[1]</sup> and Mazumdar (2010) have similar finding that Ujjayi significantly increase Breath Hold Capacity and improve pulmonary function. Six weeks Ujjayi training method was found significantly decrease on resting pulse rate, it results in strengthened heart, more efficient at transporting oxygenated blood throughout the body. Decreased respiratory make balance between heart cell demand for oxygen and the heart ability to provide it, help in reduce stress, help protect heart disease. The present study was supported by Jainoddin (2015) <sup>[4]</sup> significant reduction in respiratory rate was observed through eight weeks anulom vilom, Ujjayi and bhastrika pranayama training on Cardio-Respiratory function and psychological efficiency.

## Conclusions

1. There were significant differences found on Vital Capacity, Breath Hold Capacity, Resting Pulse Rate and Respiratory Rate which revealed that there is a significant effect of six week Pranayama programme of Ujjayi

among school girls.

2. The control group showed no significant differences found on physiological variables.

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