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Relationship of breath holding with vital capacity among swimmers

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■ **ABSTRACT**

The purpose of this study was to find out the relationship of Breath holding capacity with Vital capacity among swimmers. For the purpose of this investigation 20 male and female swimmers of Lakshmibai National University Physical Education, Gwalior were selected for the study their age ranging between 18–24 years. The data of Breath holding and Lung capacities of 20 male and female swimmers were obtained by administrating the standardised test and measurement procedures. The statistical technique used was Pearson's product movement correlation to find out the relationship of Breath holding and vital capacities among swimmers. The significance of "r" correlation co-efficient was seen with 8 degree of freedom and at 0.05 level of confidence among swimmers.

■ **Key Words :** Breath holding, Vital capacity, Swimmers

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The world of games and sports is ever expanding with increasing intensity of competitions enlarging scientific studies on human movement. Sports is dynamic in nature and progressive in outlook. It is not confined to 'what has been' but its target is to fix new targets of better glory with each attainment of target.

Breathing is an important aspect of sports. This often overlooked aspect of sport can come back and bite you if you neglect it, so you need to make sure that you know how to breathe properly when you're practicing sport. Once you learn how to breathe properly, you will want to perform exercises to help oxygen get to where it needs to be in order to improve your performance in sports. This is where Yoga shines. Yoga is all about flow, stretching, and breathing, and how you can connect all of those to form a fluid motion.

Controlling the breath cannot come easily unless one practices and develop capacities for full utilisation of available oxygen in each breath. By practicing breath control one may develop greater tolerance by checking respiratory stimulation as well as developing capacities for fuller utilisation of available oxygen in each breath (Derikachan,1980).

Breathing techniques are very specialized, because even athletes within the same sport, but competing in different events, have different breathing requirements. Unlike distance runners, sprinters aren't aiming for aerobic fitness. "Someone who runs the 100 meter dash may want to take one breath and go (Bill Dellinger, 1964).

In Swimming, Breath training is trickier when it comes to swimmers, since their breathing pattern is regulated by when, during the strokes, the swimmers breathe. Typically, swimmers try to inhale after every three or four strokes. Jane Cappaert, a sports science biomechanist with the Olympic swimming team, says that swimmers will improve their training by staying underwater for as long as they can. "It will help them maximize their oxygen consumption from each breath,". This is called hypoxic training and it seems

to translate into better performance when a swimmer is low on oxygen during a race or another hypoxic exercise is to swim freestyle, holding your breath for six strokes, then increasing it to seven, on up, in order to put you in that hypoxic state (Jane Cappaert, 1964).

Breath holding is advised to be practised with clotting nostrils by pinching them index finger and ring fingers and applying three bandhous of jalandhara (fiding chain in jugulas notch, uddiyan (diaphragm control) and nvla (contraction of perinicum). Such elaborate empirical directions seem to indicate that these practices should result in some cardio respiratory parameters. Similarly, the beneficial effect of negative breath holding is expounded by Dr, Brena in his excellent book 'yoga and medicine claim is made but strength of an elephant can be developed by practise of pranayam (Steven F.Brena, 1972).

Vital capacity and total lung capacity are related to body size and vary approximately as the cube of linear dimensions such as body height, up to age of twenty five. The individual dimensions are, however, not exclusively decreased for the size of the lung volumes. The lung volumes are about 10% smaller in women than in men of same age and size. Training during adolescence will eventually increase the vital capacity and the total lung capacity. After the age of about 30, the residual volume and functioning residual capacity increase and the vital capacity usually decreased (Astrand and Kaare Rodahl, 1986).

Lung capacity is more important for athlete if you play sports, you could always use more lung capacity. It allows you to go on without feeling tired. Your lungs will be improved over time by consistent work out and exercising. Rigorous workout will help more than slow work out. Exercising like swimming, deep breathing, bicycling would help over the long run. Building lung capacity will give you more oxygen which is essential when you are competing or playing sports. Your performance can be slower if you don't have enough oxygen. It should be a goal for every athletes to improve their lung capacity over time. Swimming under pressure could also help with improving lung capacity. Swimming going under water would also build resistance and you will gain more lung capacity.

Exercises are one of the best ways to increase lung capacity. Such exercises are also good for the cardiovascular system, because it is the joint effort of the heart, lungs and other parts of the circulatory system, to provide oxygen to all parts of the body. So cardiovascular exercises are perfect for increasing lung capacity as well as to strengthen cardiovascular functioning. Walking, running and jogging, rowing, swimming, dancing, skiing, cycling, skating, aerobic exercises, etc. should be done on a regular basis. Don't overdo any of these activities, to avoid any strain on your muscles or cause any other injury. Start these exercises in small durations and gradually increase the time limit. Apart from increasing lung capacity, these exercises are also good for the muscles. These exercises involve the consistent movement of the large muscles of the body, which triggers a strong demand for oxygen in the body. Therefore the rate of breathing increases to compensate for the oxygen demand, therebyin increasing lung capacity to a certain extent.

When you are trying to build your lung capacity, you have to do it consistently in order to improve over time. If you skip days or week, it might not be that effective. You have to do it daily in order to improve your lungs capacity over time. If you exercise for lung capacity over a six months period, you will see major improvements. If you do it for at least a year, you will have more lungs capacity then someone who doesn't train for it. You have to be trained in order to improve lung capacity. It doesn't happen overnight. You can make up a schedule to do your rigorous workout. You can work out daily or every other day for at least 30 minutes a day. If you want faster result, you can do it an hour per day. When you are exercising, you are training your lungs top take in oxygen, more than it would normally does and this is how you gain more capacity over time.

If you do this for a year, you will have more lung capacity then someone who does not exercise. Any type of rigorous exercise will do. Rigorous exercise will improve your circulation more than slow workout. When you exercise, you should also drink plenty of water to keep yourself hydrated. Swimming under pressure could also help with improving your lungs capacity. Swimming and going under water would build resistant and you will gain more lungs capacities that way. One more thing that you can try is deep breathing exercises. Deep breathing will help to improve lung capacity over time. You can do this exercise daily to help with lungs capacity. It's all about training for lungs. The more training you have the more lung capacity you would have (Kay Pierre, 2009)

Lung capacity is important for athletes and singers. If you play sports, you could always use more lung capacity. It allows you to go on without feeling tire. Your lungs will be improved over time by consistent work out and regular exercising will help more than Workout. Exercising like running, swimming, deep breathing, bicycling would help over the long run. Building lung capacity will give you more oxygen capacity to your lungs. Oxygen is essential when you are competing or playing sports. Your performance can be slower if you don't have enough oxygen. It should be a goal for every athletes or singer to improve their lung capacity over time.

You may have heard of some athletes living at higher altitudes to develop higher lung capacity. This is due to the fact that the level of oxygen in higher altitudes is lesser than that present at sea level and in order to compensate for this,

the body produces more red blood cells and hemoglobin. The body adapts to this condition and the lung capacity also increases substantially. Hence, people from higher altitudes have a higher lung capacity and red blood count and can maintain this for about 10 to 15 days, once they come back to sea level. But it can be dangerous to go to very high altitudes and train hard,it may result in altitude sickness (Elsevier, 2007).

The various lung volumes measured under resting conditions for the most part are larger in trained then an untrained man. The same holds true for women, although the absolute values are lower by approximately 25%. The majority of these changes can be attributed to the fact that training results in improved pulmonary function ant therefore in larger lung volumes (Bowers and Foss, 1998).

Cardiovascular fitness is improved by increased lung capacity. Basically, cardiovascular fitness is the body's ability to deliver oxygen to the working muscles and remove waste products. If the lungs take in more oxygen with each breath, the body receives its oxygen supply and gets rid of its waste supply without putting extra stress on the heart to work faster. If a person maintains lung capacity, the heart must beat more frequently to increase circulation in order to get more oxygen to the working muscles (Bowers and Foss, 1998).

■ METHODOLOGY

Hypothesis :

On the basis of available literature, experts guidance and scholars own understandings, it was hypothesized that there will be no significant relationship of breath holding capacity with Vital capacity with among swimmers.

Procedure :

Selection of subjects :

20 male and female swimmers of Lakshmibai National University Physical Education, Gwalior were selected for the study their age ranging between 18–24 years.

Selection of variables :

On the basis of review of literature, experts opinion, and scholars own understanding of the problem, the breath holding capacity and vital capacity was selected as a physiological variable of the study.

Criterion measures :

- Vital capacity was measured by using wet spirometer and recorded in litres.
- Breath holding capacity was measured by using the stopwatch recorded in sec.

Reliability of data :

20 male and female swimmers of Lakshmibai National University Physical Education, Gwalior were selected for the study. The reliability of data was established by using test-retest method and also reliability was ensured by establishing the tester competency and reliability of tests.

Collection of data :

The data pretaining to the Breath holding and Vital capacity was collected by administrating the specific tests, measurement procedures. Before administrating the tests the purpose of the study was explained to the subjects and the researcher solicited their co-operation which all of them readily agreed to extend.

Vital capacity :

Instrument : Wet spirometer:

The present study was taken to find out the relationship of Breath bolding with Vital capacity. The data was collected on 20 male and female swimmers of Lakshmibai National University of Physical Education who had represented in All India inter university or Senior national championships.

Analysis of data :

To find out the relationship of breath holding with vital capacity among swimmers Person's product moment method of correlation was used.

■ OBSERVATIONS AND DISCUSSION

The relationship of breath holding with vital capacity among male swimmers is presented in Table 1.

Table 1 : Relationship of breath holding with vital capacity among male swimmers (n=10)

Sr. No.	Variables	Mean	S.D	N
1.	Positive breath holding	46.98	7.02	10
2.	Negative breath holding	11.47	3.96	10
3.	Vital capacity	3.5	0.37	10

Men :

Table 2 reveals that mean and standard deviation Positive breath holding is 46.98+7.02, negative breath holding is 11.47+ 3.29, vital capacity is 3.50+.37, respectively.

Table 2 : Relationship of breath holding with vital capacity among female swimmers (n=10)

Sr. No.	Variables correlated	Correlation co-efficient
1.	Positive breath holding and vital capacity	0.99
2.	Negative breath holding and vital capacity	

Tab $t_{.05}(8) = 0.632$

Women :

Table 3 reveals that mean and standard deviation of Positive breath holding is 34.71+ 6, negative breath holding is 12.96+3.03, vital capacity is 2.49+.21, respectively.

Table 3 : Descriptive statistics

Sr. No.	Variables	Mean	S.D.	N
1.	Positive breath holding	34.71	6	10
2.	Negative breath holding	12.96	3.03	10
3.	Vital capacity	2.49	.21	10

Table 4 : Relationship of breath holding with vital capacity among female swimmers (n=10)

Sr. No.	Variables correlated	Correlation co-efficient
1.	Positive breath holding and vital capacity	0.99
2.	Negative breath holding and vital capacity	

tab $t_{.05}(8) = 0.632$

The results of the study indicated a statistically significant relationship of the positive breath holding, negative breath holding with vital capacity among swimmers (male and female).

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