



### ROLE OF KAPALABHATI IN POOR ACADEMIC PERFORMANCE OF SCHOOL GOING CHILDREN

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#### ABSTRACT

*Kapalabhati* is miracle boy of *Yoga*, *Kapalabhati* is undoubtedly one of the most popular form of breathing exercise in the yoga. This is one among the cleansing techniques or *Shatkarmas*. *Kapal* means forehead and *bhati* means light or knowledge. As the name suggests, this dynamic technique stimulates the brain, improves intellect. Poor academic performance is seen in 20% of the children, where they will be having below average IQ. However this is a 'symptom' reflecting a larger underlying problem in children. Poor academic results in child having a low esteem and they give significant stress to their parents. Apart from these classroom size, poverty, students leaving at or below poverty level, family factors, poor usage of technology, bullying, poor parent involvement, health and funding etc. all these factors badly influence and put pushing back impact on education system. *Kapalabhati* acts Detoxifier of Lungs and boosts respiratory system, it enhances the oxygen level in the blood and it reduces the level of anxiety in the children's. As the name itself indicates *Kapalabhati* is illuminative, easy, enjoyable and most effective, *Yogic* procedure to increase physical and mental health. It is important to find the reasons for a child's poor school performance and come up with a treatment plan early and it is not a permanent problem.

**Keywords:** Kapalabathi, school going children, poor academic performance

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## INTRODUCTION:

*Kapalabhati* is miracle boy of *Yoga*, *Kapalabhati* is undoubtedly one of the most popular forms of breathing exercises in the yoga. It is breathing exercise for complete body and mind. This is one among the cleansing techniques or **Shatkarmas**. *Kapal* means forehead and *bhati* means light or knowledge. As the name suggests, this dynamic technique stimulates the brain, improves your intellect and also results in a shiny forehead. It expels more carbon dioxide and other waste gases from the cells and lungs, thus improving the overall functioning of the organs, blood circulation, and mental health. It also helps tone abdominal muscles which are put to work with every exhalation. So there must be some improvement in the school performance in *Kapalabhati*<sup>1</sup>.

In all schools we find a few students performing below average. Very often teachers tend to brand them as 'slow learners'. They have no motivation to study. They are a disturbance to the class and school. Have we thought of why they are so? Statistics show that 20% of children in a classroom get poor marks, they are branded as dull students. These students mostly will be having average IQ. However this is a 'symptom' reflecting a larger underlying problem in children. Poor academic results in child having a low esteem

and they give significant stress to their parents. Apart from these classroom size, poverty, students leaving at or below poverty level, family factors, poor usage of technology, bullying, poor parent involvement, health and funding etc. all these factors badly influence and put pushing back impact on education system.

Education is said to be one of the most important aspects of human resource development and it is well known that intelligent quotient is one of the important prognostic variables in the academic outcome of children. IQ is score derived from one of the several different standardized tests to assess intelligence. Children with border line intelligence (IQ: 71-84) are slow learners, irrespective of etiology present with poor school performance. Attention, Concentration and Memory also play a remarkable role in academic performance Keeping all these in mind, it is a need the hour to work on Poor Academic Performance of students at every school. To analyse the cause and to correct it, the possible ways were such as Medication , Counseling and *Yoga*.

## REVIEW OF LITERATURE

### **Kapalabhati**

The process of *Kapalabhati* is related to the breathing process, however it is not a type of

*pranayama*. But, certain *Sadhakas* think in this manner and study *Kapalabhati* 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 *Kapalabhati* 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<sup>[2]</sup>.

#### **Pre-position:**

As this process is related to breathing, it should be performed sitting in *Padmasana*. The muscles of the stomach should be moved freely in this process. This freeness cannot be achieved while sitting or sleeping, hence the process can be performed well while sitting in a Dhyana pose. *Padmasana* is a very suitable asana for dhyana pose, hence this process should be performed while sitting in *Padmasana*. It may be performed by sitting in *Swastikasana* or *Vajrasana*, but as compared to *Padmasana*, these asanas are not so important. The pose of the body during *Padmasana* is essential here. *Kapalabhati* is not a type of *Pranayama*. It is process limited to *Pooraka* and *Rechaka* performed in a typical manner. *Kumbhaka* is not included here. Also, more importance is given to the *Rechaka* than *Pooraka*. In fact, *Rechaka* performed in a

particular manner is the main process of *Kapalabhati*. *Pooraka* is just for the namesake. *Rechaka* is more important in the process. While performing *Rechaka*, it is to be performed by way of effecting a push with the help of stomach muscles. The diaphragm and the muscles of the abdomen are to be moved violently and the air should be exhaled with the help of that movement. Hence, the *rechaka* is not prolonged and more air also is not exhaled. In day to day life, we exhale approximately 500 to 600 CC air per exhalation. During the *Kapalabhati* process, approximately 40 to 50 cc more air i.e. 550 to 650 cc air is expelled. This shows that exhaling more air is not expected during the process. When the *rechaka* is performed after such a push, when the muscles of the abdomen and the diaphragm are loosened, then automatically the air is inhaled. Only this minimal *Pooraka* is expected in the process. However, one *Pooraka* and one *Rechaka* do not constitute a cycle of *Kapalabhati*. A cycle or rotation of *Kapalabhati* should be performed as follows.

1. Keep breathing gradually while sitting in *Padmasana*.
2. Inhale and start performing *Kapalabhati* as stated before. That means a strong *Rechaka*, natural *Pooraka* and again strong *Rechaka* and natural *pooraka*.

3. Keep on doing this rotation swiftly in rhythmic manner.

4. Perform as many cycles as possible and then keep breathing gradually. All these processes are included under one cycle of *Kapalabhati*.

**Duration:**

In a cycle of *Kapalabhati*, swift *Rechakas* followed by *Poorakas* are expected. Both the actions are so swift that the duration cannot be definitely determined. However, after studying the process minutely, it can be said that *Pooraka* and *Rechaka* together about half second is the duration. (This period is further reduced by practice) Approximately three fourth time is required for *Rechaka* and one fourth for *Pooraka*. Of course, this is just to give an idea. It is not perfect and may not be strictly adhered to. It is not possible to adhere to it strictly. None of the ancient *Sanskrit Yoga* describes how many cycles of *Rechaka* and *Pooraka* should be performed in a cycle of *Kapalabhati*. When the process can be performed neatly, the *Pooraka* and *Rechaka* should be performed for at least 21 times in a cycle of *Kapalabhati*. Such three cycles may be performed in one sitting. When this much is achieved, then the repetitions within a cycle can be increased. Each one should increase the repetitions as per his individual capacity and strength. Between two cycles of *Kapalabhati*, gradual breathing should be continued. To further the study of

*Kapalabhati*, either the repetitions of *Pooraka* and *Rechaka* within a cycle should be increased or keeping those repetitions constant, the number of cycles may be increased. All these things should be considered thoughtfully on the basis of experience of one's own and under guidance of expert.

**Physical effects:**

In the process of *Kapalabhati* prolonged *Rechaka* is not expected. Hence, more air is not inhaled into the lungs. Hence, it cannot be said that more oxygen is absorbed which improves blood circulation. Generally, a little more air than is taken in the normal gradual breathing (approximately 500 to 600 CCS) is inhaled and exhaled in *Kapalabhati*. (say about 550 to 650 CC ) But more important in the process is the particular movement of the stomach muscles. However, this movement is the soul of the process. Performing *Rechaka* in this manner, does not involve movement of the cage of the chest. On the other hand, the muscles between the ribs of the cage are kept pulled while performing the complete cycle of *Kapalabhati*. In other types of breathing, these muscles remain pulled only while inhaling the breath. During *Kapalabhati* these muscles stay that way all throughout the process and the ribs are kept pulled upward. This facilitates free movement of the muscles of the stomach as well as those of the diaphragm. It does not

mean that the ribs do not move at all. A little movement is there, but it is so minute that it is not even noticed. In the process, the air is expelled through the nose after a push. Hence, it is not necessary to shut the nostrils as in *Ujjayi Pranayama*. In fact, they should be wide open. When the air is expelled, it is right to have the nostrils flared up and not contracted. In the breathing process, generally the muscles of the diaphragm cannot be controlled. Generally they are controlled by involuntary nervous system. In the process of *Kapalabhati*, control is gained over these muscles and much movement is caused, that too very swift movement and more movement than is normally done. These muscles are important muscles in the breathing process and their efficiency is increased due to such movement. The constant pushes exercise the muscles which are used for breathing, which increase their efficiency. Also, a certain pressure of air is created in the process which helps in removing the impurities in the breathing tube. The breathing tube from the alveoli is cleaned. The strong *Rechaka* and the minimal *Pooraka* help to push the impurities forward till they are thrown out of the body. While performing strong *Rechaka*, a draft of more pressure is created which affects the different vessels to improve their function. The effect of the push of the *Rechaka* is seen

on the brain and the nervous system and their efficiency also increases.

*Kundalini* Power is a dormant power residing near the *Muladhar Chakra* near the lower abdomenn. The pushes in the *Kapalabhati* awaken this power. That means the centre of effector nerve fibres over there is affected and this divine power starts climbing up the *Sushumna Nadi*. Of Course, all this requires detailed discussion and this discussion is beyond the purview of this syllabus. Hence, it is not discussed here. However, it may be remembered that this process of *Kapalabhati* helps awakening of *kundalini* power. In this process of *Kapalabhati*, the carbon dioxide is thrown out of the body in large quantity and similarly in the same proportion, the oxygen is absorbed into the body. This increases the oxygen in the blood, hence the need for oxygen is lessened and the messages or the encouragement to breathing center is calmed down. The center becomes calm and reduces its instructions to the breathing organs. This facilitates control of the breathing organs. If there are urgent messages from the main center, then the organs follow those messages and it is not possible to control the movements of the organs. Hence, before studying *pranayam*, if *Kapalabhati* is practised for 2 / 3 times, then *pranayam* can be studied effectively.

Kapalabhati influences organs under the skull mainly the brain and the small brain are in a good manner. Kapalabhati pranayama helps to detoxify lungs and respiratory tracts, boosts the supply of oxygen and purifies blood and helps to tone up the abdominal muscles.

**Precaution:**

It is said that in a cycle of *Kapalabhati*, maximum repetitions of *Rechaka* and *Pooraka* should be performed. For a common person, 120 repetitions per minute i.e. two per second is an ideal ratio. *Sadhakas* above the level of common person can go up to 200 repetitions. It is not advisable to increase the number beyond that. Patients suffering from heart diseases, lung trouble should practice this under an expert guidance. Those suffering from diseases of blood circulation should perform the process very carefully. They should perform the process under the guidance and care of experts<sup>3</sup>.

**Side effects of Kapalabhati Pranayama practice**

Kapalabhati, if not performed correctly, or under supervision, can lead to some side effects and your quest on how to sleep easy will never be resolved. These include:

1. Kriya can lead to high blood pressure.
2. Kapalabhati may also cause a hernia.
3. A vomiting sensation is likely if kapalabhati is not performed on an empty stomach.

**Mechanism of Kapalabhati**

4. Some people complain of dizziness and headache after their first session of these breathing techniques.
5. The kriya can cause your mouth to either dry up or salivate excessively.
6. Since kapalabhati requires a lot of energy, it can cause excessive perspiration.

When *Pooraka* and *Rechaka* are performed rapidly as in bellows of a blacksmith. It is known as *Kapalabhati*. The study of *Kapalabhati* reduces *kapha doshas*. Both *Gherand Samhita* and *Hatha Yoga pradeepikakar* agree that the practice of *Kapalabhati* eliminates *kapha doshas*. *Hatha Yoga pradeepikakar* describes the process in detail. And the simile used by them is very apt in the sense that if one observes the movement of the bellows, the fan is pressed to release the air out with force and then loosened to let the air in with natural ease. Similarly, a forceful *Rechaka* and natural *pooraka* with rapid movement is expected in *Kapalabhati*. Hence, the description by *Hatha Yoga pradeepikakar* is more proper and clear than that given by *Gherand Samhita* and is more in vogue.

### **Kapalabhati (breath of fire)**



Involves short & strong forceful exhalations and inhalations



It is intended mainly for cleaning sinuses or removing impurities in the Respiratory system there by it cleanses or detoxifies the blood.



Fighting against cell damage occurs



Influence the brain cells that regenerate the brain tissues.



Cures brain related ailments



Improves Learning, Intellect, Memory, Concentration & Brain function.

#### **Benefits of Kapalabhati**

1. Since this kriya requires a lot of energy, it generates body heat, thus dissolving toxins and waste matter.
2. The breathing technique is known to enhance the functioning of the kidneys and liver.
3. One of the important benefits of Kapalabhati pranayama is that it relaxes the eyes, and as a result of that, can help do away with dark circles as well as premature signs of aging.
4. It improves blood circulation and digestion.
5. Kapalabhati Prayanama benefits from weight loss as well. This is possible as it increases metabolic rate rapidly.
6. The kriya stimulates the internal organs, especially the abdominal ones, and therefore, helps people with diabetes.
7. This breathing technique practice refreshes the brain. It energizes nerves.
8. Since Kapalabhati Pranayama calms mind, it benefits by helping with mood swings and minor anxiety.
9. This kriya gives sense of balance, thus making brain feel de-cluttered and de-stressed. It also makes to feel relaxed. Hence, this is considered as one of the most significant benefits of Kapalabhati pranayama.
10. This kriya helps with acidity.
11. One of the most noteworthy benefits of Kapalabhati pranayama is that it enhances

the capacity of lungs and makes them stronger.

12. Since it produces sweat, it opens up your skin pores and cleanses it of the toxins. It makes skin to glow after performing the kriya. A shining skin and shining face are definite.

13. It activates the chakras in your body. It helps with sinus and asthma. It is known to cause hair growth. And it fills you with positive energy.

### **Reasons for poor academic performance**

Education is one of the most important aspects of human resource development. Every child should have the opportunity to achieve his or her academic potential. It is generally noticed that at least 20% of children in a classroom get poor marks - they are "scholastically backward". Poor school performance should be seen as a "symptom" reflecting a larger underlying problem in children. This symptom not only results in the child having a low self-esteem, but also can cause significant stress to the parents. It is essential that this symptom be scientifically analyzed to discover its underlying cause(s) and find a remedy. This article reviews the causes for children to have poor school performance and describes its management.<sup>4</sup>

### **Causes of Poor School Performance:**

There are many reasons for children to underperform at school, such as, medical

problems, below average intelligence, specific learning disability, attention deficit hyperactivity disorder, emotional problems, a poor socio-cultural home environment, psychiatric disorders, or even environmental causes<sup>5</sup>.

### **(1) Medical Problems**

These conditions have been reported to have an independent effect resulting in poor school performance.

#### **(a) Preterm birth and low birth weight (LBW):**

Up to 33% of children born between 32 and 35 weeks gestation and up to 25% of LBW babies (< 2000 g) are at risk for school difficulties into late childhood, even when not neurologically impaired. Arithmetic, vocabulary, concentration, non-verbal intelligence and attention problems are significant mediators of the effect of LBW on the school performance score. Children born preterm, small for gestational age or with very low birth weight (<1500 g), tend to have the poorest cognitive abilities<sup>6</sup>

#### **(b) Malnutrition and nutritional deficiencies:**

Malnutrition in early childhood is associated with poor cognition in later years and this is independent of psychosocial adversity. Chronic iron deficiency anemia, zinc deficiency and inadequate intake of vitamins A, B 1, B2, B6, D3, and E and niacinamide adversely affect long-term cognitive development.

**(c) Worm infestations:** Infestation with roundworm, hookworm and whipworm often affects malnourished children's school performance because it can stunt growth, decrease physical activity, and cause poor mental development<sup>7</sup>.

**(d) Hearing impairment:** Children with otitis media with effusion and associated conductive loss during the first 4 years of life have been reported to score lower in math and expressive language between kindergarden and second grade. Mild sensor neural hearing loss affects about 5 % of the school-aged population and these children experience difficulty on a series of educational and functional test measures. Low birth weight and pyogenic meningitis are known risk factors for sensor neural deafness.

**(e) Visual impairment:** Amblyopia is present in 1.6-3.6% of preschool children and if left uncorrected may harm school performance. Reduced vision because of uncorrected refractive error is a major public health problem in children in India. Murthy et al have reported an age-related shift in refractive error from hyperopia in young children (15.6% in 5-year-olds) toward myopia in older children (10.8% in 15-year-olds). Overall, hyperopia is present in 7.7% of children and myopia in 7.4%. The risk of refractive errors is higher in preterm infants than in infants born at term.

**(f) Asthma and allergic rhinitis:** Children with poorly controlled asthma have increased school absenteeism. Children with moderate to severe "chronic asthma" may perform poorly due to the stress associated with a chronic illness. Even short-term administration of theophylline to asymptomatic asthmatic children can adversely affect school performance. Both uncontrolled symptoms of allergic rhinitis.

**(o) Habitual snoring:** Sleep-disordered breathing with habitual snoring is associated with hyperactive, inattentive behavior and poor academic performance in primary school children. This underachievement may continue even after the habitual snoring ceases post tonsillo-adenoidectomy.

## **(2) Below Average Intelligence:**

It is well known that intelligence (measured as the intelligence quotient or IQ) is one of the important prognostic variables in the academic outcome of children. Children with irrespective of the etiology (past history of prematurity, neonatal TORCH infections, meningitis, encephalitis, head injury; Down syndrome, Fragile X syndrome, Turner syndrome, Klinefelter syndrome, etc.) present with poor school performance or school failure. Children born and brought up in iodine-deficient environment have significant impairment in language, memory, conceptual thinking, numerical reasoning and motor skills.

Children with below average intelligence usually have history of developmental delay.

### **(3) Neurobehavioral Disorders:**

**(a) Specific learning disability (Sp LD):** Sp LD viz. dyslexia, dysgraphia and dyscalculia is a generic term that refers to a heterogeneous group of disorders manifested by significant unexpected, specific and persistent difficulties in the acquisition and use of reading (dyslexia), writing (dysgraphia) or mathematical (dyscalculia) abilities despite conventional instruction, normal intelligence, proper motivation and adequate socio-cultural opportunity. SpLD is presumed to be due to central nervous system dysfunction. A history of language delay, or of not attending to the sounds of words (trouble playing rhyming games with words, or confusing words that sound alike), along with a family history, are important red flags for dyslexia. Substantial evidence has established that the children with dyslexia have deficits in phonologic awareness. The functional unit of the phonologic module is the "phoneme", defined as the smallest discernible segment of speech; for example, the word "bat" consists of three phonemes: / b // ae / / t / (buh, aah, tuh). Children with dyslexia have difficulty developing an awareness that words, both written and spoken, can be broken down into smaller units of sound and that in fact, the letters constituting the printed word represent

the sounds heard in the spoken word. Dyslexia is genetically inherited generally outnumber girls in the ratio of three to one. Children with SpLD fail to achieve school grades at a level that is commensurate with their intelligence. Repeated spelling mistakes, untidy or illegible handwriting with poor sequencing, inability to perform simple mathematical calculations correctly are the hallmarks of this lifelong condition.

Dyslexia affects 80% of all those identified as learning-disabled and its incidence in school children in USA ranges between 5.3- 11.8%. Information on SpLD in Indian children is scanty. The incidence of dyslexia in primary school children in India has been reported to be 2-18%, of dysgraphia 14%, and of dyscalculia 5.5%.

**(b) Attention deficit hyperactivity disorder (ADHD):** ADHD affects 8-12% of children worldwide and results in inattention, impulsivity and hyperactivity. Children with ADHD are at risk for poor school performance. Up to 20-25% of children with ADHD have SpLD and vice versa.

**(c) Autism:** Even non-retarded autistic children face a lot of problems in school as their core features (impairment of reciprocal social interactions, impaired communication skills and restricted range of interests or repetitive behaviors) impair learning. These core features do not change qualitatively. Also,

they often demonstrate distress and opposition when exposed to requests to complete academic tasks.

**(d) Tourette syndrome (TS):** Children with TS are at a higher risk for academic failure. In the majority of TS patients, the disorder starts with ADHD and 2.4 years later, develops motor and vocal tics. Specific cognitive deficits, presence of co-morbid conditions, notably ADHD and oppositional conduct disorder significantly increase the likelihood that an individual with TS will also have learning problems.<sup>8</sup>

#### **(4) Emotional Problems:**

Conditions which cause emotional problems in children viz. chronic neglect, sexual abuse, parents getting divorced or losing a sibling might cause long term distress resulting in academic underachievement. Children can face severe emotional upheavals during the treatment of chronic health impairments such as asthma, cancer, cerebral palsy, congenital heart disease, diabetes mellitus, epilepsy, hemophilia, rheumatic diseases, or thalassemia, resulting in low self-esteem and loss of motivation to study. Despite average intelligence, absence of significant family dysfunction and advantaged social background, a large number of children with isolated growth-hormone deficiency or with idiopathic short stature develop low

self-image, behavioral problems and have academic underachievement. In recent times, HIV infected children have also been reported to exhibit clinically significant emotional problems.<sup>9</sup>

#### **Poor Socio-cultural Home Environment:**

It has been recognized that children from poor socio-economic status families have higher chances of poor school performance. Malnutrition due to poverty coupled with low education and status of parents adversely affect their cognitive development. Such children also have higher chances of experiencing, right from their pre-school years, parental attitudes which do not motivate them to study and an unsatisfactory home environment which does not encourage learning (witnessing domestic violence, family stressors, adverse life events). Another feature we regularly observe in our clinic is that many of these disadvantaged children are studying in English medium schools as their parents believe that this would help them progress in life. These children face the added burden of "language barrier", namely, they are not conversant in English as they came from non-English speaking families, which leads to poor school performance or even school failure.<sup>10</sup>

#### **Psychiatric Disorders:**

Poor academic functioning and inconsistent school attendance are the early signs of emerging or existing depression or psychosis.

Clinicians need to inquire not only about the classic symptoms of depression such as anhedonia but also about less obvious symptoms such as unprovoked irritability, unsubstantiated complaints of lack of love from family members, somatic complaints, and problems with concentration in school. Conduct disorder and oppositional defiant disorder are other known psychiatric causes of poor school performance. It is well known that Wilson disease and subacute sclerosing pan encephalitis (SSPE) can present as change in the child's personality and deteriorating school performance<sup>11</sup>.

#### **Environmental Causes:**

Children living in noisy environment can exhibit poor academic performance. Too much television-viewing among children has been linked with inadequate study patterns. Inappropriate television-viewing among adolescents has been linked to erratic sleep / wake schedules and poor sleep quality, violent or aggressive behavior, substance use, sexual activity resulting in decreased school performance or even school drop-out. There is irrefutable evidence that environmental-lead exposure can lead to mild intellectual impairment, hyperactivity, shortened concentration span, hearing impairment, violent / aggressive behavior all resulting in poor school performance<sup>12</sup>.

#### **DISCUSSION**

**Kapalabhati:** *Kapalabhati* breathing is an advanced yogic breathing technique, often known as "skull-shining breath. It's an exercise that purifies, rejuvenates, and invigorates the mind and body. When practiced this breath, visualizes skull filling with a bright light; this is how its name came about. This cleansing breath can help not only release stress and toxins from the mind and body, it can also help release negative emotions, shake off sluggishness, and energize. It consists of a series of forceful exhalations followed by passive inhalations. Due to this process, the organs under the skull mainly the brain and small brain are influenced to greater extents. Kapalabhati helps to detoxify lungs and respiratory tracks boosts the supply of oxygen, purifies blood and helps to reduce the level of anxiety and negative effects. These changes are associated with the modulation activity and connectivity in a brain areas involved in emotion processing, attention and awareness.

#### **Physiological changes during and after kapalabhati**

Kapalabhati is a automatic inhalation technique. The air is inhaled normally, but expiration is forced with the help of the abdominal musculature.

In normal circumstances, exhalation is a passive process by which there is an automatic recoiling of the diaphragm forcibly exhaling the air out of the lungs. The abdominal

muscles, namely the external and internal oblique, rectus, and transverses abdominis, which are not normally used in quiet breathing, are the most powerful muscles for forced exhalation. Contraction of these muscles applies pressure on the abdominal organs which then eventually push diaphragm up ending in forcible exhalation. Abdominal breathing produces a slow yet large tidal volume and is known to produce emotional stability and controlled responses to the stressful environment. This can be due to elevated parasympathetic over sympathetic activity leading to better oxygenation of brain and heart in spite of low heart rate. Oxygen consumption rates during Kapalabhati breathing practice are approximately 1.1–1.8 times higher than while sitting quietly. As far as heart rate is concerned, there was a rise in heart rate for the initial 20–40 s of rapid breathing which then leveled off to the higher side.

Although Kapalabhati is rapid breathing, it does not cause hyperventilation. This can be proved by the fact that the side effects of hyperventilation such as dizziness does not occur during the practice. Adding on, patients with dizziness and syncopal attacks are advised to stop the pranayama immediately. The heart rate during and after Kapalabhati is different from that of occurring in hyperventilation. The mean carbon dioxide

concentrations after Kapalabhati technique are similar to that of resting state.<sup>13</sup>

**Poor academic performance:** Education is fundamental right of every child, poor academic performance is a headache for the parents, teachers and country. 20% of children are under performing or they are considered as slow learners in schools due to various physical, psychological, emotional, socio-economic status etc. such a children need extra attention and care to make them to perform good in schools. It even includes teaching methodologies, technology and surroundings. Poor academic performance can be rectified at any given time<sup>14</sup>.

**Discussion on factors affecting Poor academic performance:**

**Individual:**

There are many reasons for children to underperform at school, such as, medical problems, family, educational status, economy, surroundings, friends, hygiene, food, politics, and entertainment, in recent years excess use of electronic gadgets etc as child daily come across these situations and faces it. In case of health issues the information provided by the parents, class teacher and school counselor about the child's academic difficulties guides the pediatrician to form an initial diagnosis. However, a multi-disciplinary evaluation by an ophthalmologist, otolaryngologist, counselor, clinical

psychologist, special educator, and child psychiatrist is usually necessary before making the final diagnosis. It is important to find the reason(s) for a child's poor school performance and come up with a treatment plan early so that the child can perform up to full potential.<sup>15</sup>

#### **School:**

However, supportive and favorable school environment enriched with enough learning facilities and favorable climate makes children more comfortable, more concentrated on their academic activities that resulted in high academic performance. The forces of the environment begin to influence growth and development of the individual right from the womb of mother. Similarly the methods of teaching and involvement of child in school The immediate surrounding after home is school. So physical, mental social, cultural and psychological process of development are developed in school environment at earliest age of children. As observed from the research, children from school with adequate learning facilities like lighting, ventilation, water supply, toilets, playground, teaching methodology, adequate teaching and learning equipment's, good teacher children relationship and favorable learning environment helps to perform well.

#### **CONCLUSION**

1. *Kapalabhati* acts Detoxifier of Lungs and boosts respiratory system, it enhances the oxygen level in the blood and it reduces the level of anxiety in the children.
2. As the name itself indicates *Kapalabhati* is illuminative, easy, enjoyable and most effective, *Yogic* procedure to increase physical and mental health.
3. Kapalabhati helps in refreshes the brain, energizes nerves, calms mind, and it also benefits by helping with mood swings and minor anxiety. Kriya gives sense of balance, thus making brain feel de-cluttered and de-stressed. It also makes you feel relaxed. Hence, this is considered as one of the most significant benefits of Kapalabhati pranayama in enhancing poor academic performance.
4. It is important to find the reasons for a child's poor school performance and come up with a treatment plan early and it is not a permanent problem.
5. *Yoga* should be performed under trained *Guru*, *Kapalabhati* should be a routine practice than situational.

#### **REFERANCES**

1. Acharya YT, Acharya NR. Sushruta Samhita of Sushruta. 7th ed., Varanasi: Chowkamba orientalia, 2003, PP:498

2. Vishwanath Dwivedi Shastri, Bhavaprakasha Nighantu of Bhavaprakasha, Delhi, Motilal Banarsidas, 1997, PP: 775
3. Acharya YT, Acharya NR. Sushruta Samhita of Sushruta. 7th ed., Varanasi: Chowkamba orientalia, 2003, PP:7
4. Kapalabhati - Shatkarma, Breathing technique [Internet]. Yogapoint.com. 2021 [cited 8 July 2021]. Available from: <https://www.yogapoint.com/info/kapalabhati.htm>
5. Kamat VV. A revision of the Binet scale for Indian children:(Kanarese and Marathi speaking). Br J Educ Psychol 1934;4(3):296-309.
6. Einstein, A., B. Podolsky, and N. Rosen, 1935, "Can quantum-mechanical description of physical reality be considered complete?", Phys. Rev. 47, 777-780.
7. Wechsler Intelligence Scale - an overview | ScienceDirect Topics [Internet]. Scienencedirect.com. 2021 [cited 8 July 2021]. Available from: <https://www.sciencedirect.com/topics/medicine-and-dentistry/wechsler-intelligence-scale>
8. Acharya YT, Charaka Samhita of Agnivesha, 5th Ed, Varanasi, Choukhambha Prakashana, 2007, PP: 376
9. Acharya YT, Acharya NR. Sushruta Samhita of Sushruta. 7th ed., Varanasi: Chowkamba orientalia, 2003, PP:498
10. Karande S, Kulkarni M. Poor school performance. The Indian Journal of Pediatrics. 2005;72(11):961-967.
11. Report card - Wikipedia [Internet]. En.wikipedia.org. 2021 [cited 8 July 2021]. Available from: [https://en.wikipedia.org/wiki/Report\\_card](https://en.wikipedia.org/wiki/Report_card)
12. Education in India - Wikipedia [Internet]. En.wikipedia.org. 2021 [cited 8 July 2021]. Available from: [https://en.wikipedia.org/wiki/Education\\_in\\_India](https://en.wikipedia.org/wiki/Education_in_India)
13. Home - PMC - NCBI [Internet]. Ncbi.nlm.nih.gov. 2021 [cited 8 July 2021]. Available from: <https://www.ncbi.nlm.nih.gov/pmc/>
14. Anna Moreshwar Kunte .Ashtanga hrudaya of Vagbhata. 7th ed, Varanasi: Chowkamba Samskrit Adhishtan, 2002: 923
15. Poor School Performance [Internet]. ResearchGate. 2021 [cited 8 July 2021]. Available from: [https://www.researchgate.net/publication/7380860\\_Poor\\_School\\_Performance](https://www.researchgate.net/publication/7380860_Poor_School_Performance)

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