



## Role of Yoga and Pranayama During Covid-19 Pandemic Challenges

**Mukesh Sharma**

Physical Education Teacher, Department of Youth Services & Sports, Govt. School District Kathua,  
Jammu & Kashmir, India  
Email – [mukeshlavotra1415@gmail.com](mailto:mukeshlavotra1415@gmail.com)

**Abstract:** An epidemic, COVID-19, has been identified in the Wuhan City of China. It affects a large number of people around the world. COVID-19 has a high rate of recovery. Those who have survived the epidemic are dealing with long-term effects on all three dimensions of their health: physical, physiological, and psychological. The lungs are the primary organs impacted by SARS-CoV-2 in COVID-19, whereas the immune system, physical health, and mental health are all weakened by COVID-19. The rate at which corona virus illness infection spreads is increasing every day, and there is still no vaccine available to date, making it vital to discharge patients with minor symptoms as soon as possible. These factors make it critical to create rehabilitative plans to help these low-risk patients regain their physical health, respiratory function, and overall well-being. After COVID-19, yoga has played a significant role in lowering psychological stress and boosting the immune system, which in turn helps to prevent infection and its repercussions. Practicing yoga can help keep your lungs healthy and your immune system strong. Through regular use of the yoga breathing practises (pranayama), the lungs' ability to move air, hold more air, and be more efficient is improved. Exercises including seated and standing poses, breathing exercises and general yoga training may assist improve respiratory capacity in those with chronic obstructive pulmonary disease.

**Key Words:** Covid-19, Pranayama, Immune System, Epidemic.

### 1. INTRODUCTION :

Many people use the word yoga as an umbrella phrase to refer to a variety of different physical, mental, and spiritual disciplines that originated in ancient India and are today found in many different religions. Yoga means "yoke" in Sanskrit, from the root yuj, which means "to connect, to merge, or to attach. In the 2nd century BC, Patajali coined the phrase to describe a system of abstract meditation or mental abstraction. A yogi or yogini is a person with a strong dedication to yoga or the yoga philosophy who does yoga or follows the yoga philosophy. In Hinduism, there are six orthodox systems of thought: yoga is one of them. Our yoga rishis have long held vast knowledge about the human body, emotions, and mind, and how they work. We have anatomical terminology for all of the body parts we know today in our ancient sanskrit writings, as well as remarkable insights into the physiological functions of the body and the impact emotions and the mind have on the same body. The original "holistic" notion of yoga, which means union or oneness, is now widely recommended by both science and religion to help restore a person to their original immaculate mental clarity, purity of emotions, and cleanliness of body and environment.

A scientist's approach to yoga's practise is required because it is a science. The goal of yoga is the establishment of a harmonious relationship between the body and the mind. Various strategies and methods are employed to achieve the highest state of awareness. The goal of yogic discipline is to raise one's degree of consciousness from the gross body to pure consciousness.

A corona virus is to blame for the current pandemic situation, i.e. COVID-19, which is a severe acute respiratory illness. Because of its rapid spread and high incidence, it has been deemed a worldwide health emergency. COVID-19 can afflict people of any age, as evidenced by the global case count. But according to WHO guidelines, people with low immunity or older than 60, people with coexisting chronic disease or previously diagnosed respiratory (chronic lung disorder, bronchial asthma, etc.), cardiovascular, endocrine, or inflammatory diseases, or morbid obesity or diabetes mellitus, are more likely to have a severe and critical COVID -19 exhibition with a high mortality rate (Zhang, Wang, & Jia, 2020). Immune compromise can be caused by a variety of factors, including long-term use of immune weakening



drugs such as chemotherapy, corticosteroids, etc., previous organ or bone marrow transplants, and addictions like smoking (Chakraborty & Maity, 2020).

The new corona virus predominantly affects the respiratory system by transferring by droplets and close contact such as coughing, sneezing, etc. It shows up in the form of acute respiratory symptoms such as fever, cough, tiredness, and dyspnea to severe pneumonia. The infection begins with mild flu-like symptoms or no symptoms at all, and then progresses to more severe ones. Acute respiratory distress syndrome (ARDS) symptoms range from mild hypoxia to severe respiratory distress (Yuki, Fujiogi, & Koutsogiannaki, 2020).

In the absence of a conventional treatment for COVID-19 prevention or management, it is critical to boost the body's immunity, especially the respiratory system, which is the organ most usually impacted. Fighting this terrible scenario necessitates urgent attention to the maintenance of a strong immune system (Palem & Palem, 2020). It is the immune system's job to protect the body from foreign invaders like germs and viruses. Inadequate nutrition of the organs and tissues leads to an increased risk of infection and a slower rate of recovery from sickness and injury. Yoga and pranayama practises may be beneficial in this situation for strengthening the lungs and boosting immunity in general. If done rationally and scientifically, these less invasive procedures can likewise provide the above-mentioned systemic benefits.

## **2. YOGA AS EXERCISE IN COVID-19 :**

Despite the benefits of aerobic and strength training in rehabilitation, post viral tiredness is a serious problem. Even after being discharged from the hospital, most COVID patients experience continuing fatigue and respiratory distress, and the first 6-8 weeks may be critical in this regard. Patients suffering from post viral fatigue may benefit more from short exercise sessions (Ho- Yen. 1990). Also, short-duration, more frequent exercise sessions may produce the best cognitive effects in people with cognitive impairments (Sanders et al, 2019). As a result, we must concentrate on low-energy expenditure exercise programmes that nonetheless target strength, conditioning, and better respiratory and cognitive capabilities. Yoga as a kind of exercise can help you obtain all of these advantages. Patients may benefit greatly from a combination of asanas and pranayam (breathing techniques) for the first 6 weeks before returning to suggested levels of regular aerobic and strength exercise. Yoga asanas and pranayam have been shown to enhance respiratory health, physical fitness, and mental sharpness. In fragile older persons, pranayam was found to be just as effective as a spring loaded negative pressure breathing apparatus for training the inspiratory muscles (Cberia et al, 2014). Older patients did better with pranayam than with inspiratory threshold training. Yoga asanas improve expiratory lung capacities and chest expansion (Chanavirut et al, 2006). Bhramri pranayam has also been shown to increase the expression of nitrous oxide by humming and to raise carbon dioxide by prolonged exhale, therefore reducing coagulopathies (Taneja MK. 2020). Additionally, studies have shown that yoga practises are superior to commonly advised forms of exercise in terms of cardiorespiratory fitness (Sovova et al, 2015). For functional fitness, yoga and a stretching and strengthening exercise routine both produced comparable gains (Gothe et al, 2016). Schoolchildren who practise yoga had greater absorption of nutrients, according to research (Verma et al, 2017). A six-week yoga practise has been shown to improve cognitive function (Brunner et al, 2017). There is greater evidence that a 10-week yoga intervention reduces stress and anxiety and improves mental health than relaxing (Smith et al, 2007; Kim SD. 2015). The benefits of yogic activities include increased muscle strength and flexibility, improved respiratory and cardiac health, reduced stress, and better sleep (Woodyard C. 2011).

## **3. REVIEW OF LITERATURE :**

The researcher made an academic effort to review relevant literature and research on the study's various elements, broadening the horizons and body of knowledge on the subject.

**Andrea Demeco, including Nicola Marotta, M. Barletta, Cinzia Marinaro, Annalisa Petraroli, and Antonio Amendolia, (2020).** Patients who have been infected with the coronavirus disease 2019 (COVID-19) should receive rehabilitation services. We looked at the most recent reports because there were no guidelines in English for the rehabilitation of these patients. We used the major research databases to conduct this literature evaluation, which included randomised trials, recommendations, quasi-randomized or prospective clinical trials, reports, guidelines, field updates, and letters to the editor. After screening the complete text or abstract, we culled the 107 studies that surfaced in the database search. Finally, a total of 22 research projects were considered. Because of the clinical setting's



complexity and the coronavirus's rapid transmission, patients with moderate symptoms of severe acute respiratory syndrome (SARS-CoV) should be discharged from the intensive care unit (ICU) as soon as feasible. Patients with co morbidities, those who live alone or in rural areas, or those who have a low quality of life must have rehabilitation programmes tailored to their specific needs in order to help them regain physical and respiratory function while also reducing stress and sadness.

**Mahesh kumar Kuppasamy, Dilara Kamaldeen Pitani, Ravi, Julius Amaldas, and S. Poonguzhali (2017).** The practise of pranayama, a part of yoga, is incredibly beneficial to the human race in maintaining good physical and mental health, and this article intends to gain insight into studies conducted on the efficacy of Bhr.P on health. Medline, Embase, Google scholar, and a manual search turned up all of the research done up until May of this year. On the basis of prisma guidelines, studies on the health efficacy of Bhr.P particularly were included. The information was specified by the study's goals, methods, context, findings, interventions, and conclusions. MQRs and NOS scales were used to assess the quality of the included research' methods and present their findings. Six studies met the criteria for inclusion, including two on the cold pressor test, one on heart rate and blood pressure, one on EEG alterations, and one each on the inhibitory response and tinnitus condition. According to the research, para-sympathetic behaviours such as Bhr.P are dominant. Bhr.P has some hopeful impacts on a variety of physiological systems. The included studies' methodological quality was rated as "extremely low," and none of them was an RCT. However, the research accessible are diverse, covering a wide range of topics, and this diversity acts as a resource for the small number of studies on Bhr.P. Further large-scale, well-designed, randomised trials of Bhr.P on multiple systems are therefore required to justify these effects effectively.

**Pallav Sengupta was a great scholar (2012).** Yoga has its roots in India, where it has been practised for thousands of years. Today, people are becoming increasingly aware of the benefits of yoga and pranayama, which have been shown to be an excellent strategy for both improving health and preventing and managing diseases. Yoga's therapeutic features are also being investigated as a result of expanding scientific research in this discipline. Yoga has been shown to lower stress and anxiety, improve autonomic functioning by activating neurohormonal processes that suppress sympathetic activity, and even now, multiple studies suggest that yoga is beneficial for cancer patients' physical health. The growing popularity of yoga around the world is more evidence of India's growing cultural impact.

#### **4. OBJECTIVE OF THE STUDY :**

Due to the overwhelming demand, a review study is being prepared to combine the many Yoga practises for immune development that can be employed as supportive and preventative therapy for COVID-19.

#### **5. MATERIALS AND METHODS :**

It's a review study with the goal of compiling various yoga practises such as classical texts, yoga treatment textbooks, Gherand samhita and modern scientific publications, research articles and e-media. Information gathered from various sources is narrated in a clear and tabular manner under the headings concept of immunity in Ayurveda, various Yoga Practices (Pranayam & Asanas, i.e. Exercises) with their possible Immuno-modulator effects, importance & benefits of Yoga for the prevention of pandemics like COVID -19.

#### **6. RESULTS AND DISCUSSION:**

##### **Pranayamas and their Efficacy**

To make significant progress in the study of pranayama's effects, more research is required. You can develop control of your emotions and other mental states by learning to control your breath. As we build an awareness of our breath, we become more sensitive to our thoughts and the flow of energy in our bodies, and we become more conscious of our energy. Breathing has a direct impact on the heart, brain, and neurological system, with an anxiety or well-being connection between the breath. When under stress, people tend to breathe more quickly, more frequently, and with greater effort. This respiratory pattern keeps the subject arousable. Slower and deeper breathing reduces the partial pressure of carbon dioxide in the lungs and the bloodstream, resulting in a more relaxed state via autonomic reflexive stimulation. Blood becomes less acidic and blood oxygen production becomes more efficient as the pH of the blood rises in correlation. Metabolic and cognitive advantages can be shown as well. When you take a deep breath, your noradrenalin levels go up. Noradrenalin is a hormone and neurotransmitter in the neurological system.



In post-COVID therapy, strengthening respiratory capacity and cardiovascular endurance are crucial components. This should be done while also taking into account diminished energy and fatigue levels. It is simple to increase diaphragmatic breathing and lung gas exchange by performing pranayam breathing exercises based on the yoga philosophy. Bhramri pranayam is thought to be critical in COVID-19. Asanas like matsyendrasana and its variations, which focus on expanding the chest by strengthening thoracic mobility, might also be beneficial. Proprioception and flexibility are enhanced by extending and maintaining an end range position. Setubandhasana and marjariasana, which target core muscular endurance, can assist increase general stability and endurance. Pawanmuktasana and balasan help visceral organs operate better, as well as loading the diaphragm and improving respiratory function. When you're feeling out of breath, try balasana as a yoga practise to help you relax. Shavasana is widely regarded as a highly effective relaxing practise, and it is the ideal way to conclude a workout session. As the patient becomes more comfortable with the yoga activities, more strengthening and endurance components can be incorporated.

Pranayam can be used to kick-start the workout. The initial duration of each pranayam is 2-3 minutes, and this can be increased to five minutes over time. Asanas can be held for 15-30 seconds at first for 3-5 repetitions and then increased to 1 minute. Shavasana, a restorative pose, can be used at the end of a workout session to promote relaxation. Following the rehabilitation recommendations' contraindications and criteria for ending an activity programme is acceptable (Zeng et al, 2020; Spruit et al, 2020). In India, yoga is well-integrated into the physiotherapy curriculum, giving physiotherapists the information they need to incorporate yogic activities into patient rehabilitation. It is imperative that a rehabilitation plan that is both comprehensive and simple to implement be developed immediately. More difficult will be putting recovery plans in place for the general public. Through television, yoga has become a very popular form of exercise among the Indian public. This medium could be used to create a brief and basic yoga programme for the benefit of COVID recovered patients. Administering exercises for rehabilitation may be made easier with the use of physiotherapy professionals all around the world.

### **Role of Pranayam for development of Immunity**

Pranayama is an excellent form of exercise since it strengthens the lungs and the respiratory system as a whole while also activating the lymphatic system and bringing the neurological system back into balance. It also has the additional benefit of lowering stress hormone levels. The toxic poisons are expelled by rhythmic and controlled breathing while the blood flow to the liver, heart, and brain is increased to the optimum level.

The diaphragm is activated when someone inhales deeply and consciously from the belly. The digestive system is strengthened as a result of this belly breathing. Since the digestive system folds contain 80 percent of the immune system, it has an effect on immunity enhancement. Holding your breath has the potential to alter the genetic activity of white blood cells, but it also appears to greatly increase the number of WBCs in the body, which could be beneficial in the battle against sickness.

Pranayama is one of the best workouts for the lungs, and it can help with a variety of health issues, including weight reduction and diseases associated with stress. Incorporating Pranayama into one's daily routine can help control respiratory conditions like COVID-19 by boosting lung efficiency and immunity.

### **7. YOGA'S IMMUNE-MODULATING PROPERTIES IN THE FIGHT AGAINST COVID-19 :**

Because COVID-19 is a disease that affects the respiratory system and immune-compromised individuals, it is critical to increase overall physical immunity and strengthen the respiratory system. Yoga's holistic techniques help every day the physical and microscopic systems of the body. It enhances the body's natural defence mechanisms, which helps to keep diseases at bay or improve overall health (Sharma, Sharma, & Sharma, 2018). As a bonus, it flushes the body of dangerous pollutants while improving blood flow to organs such as the liver, heart, and brain. In other words, it keeps illnesses at bay while simultaneously influencing the mind and emotions. Yoga's diverse physical postures help regulate one's physical and emotional wellbeing. Sedentary people are more likely to acquire hypertension than physically active people, therefore regular practise of the postures helps people keep their weight stable. Regular Yoga practises reduce stress hormones through meditation, resulting in lower blood pressure and a weakened immune system. The respiratory system, particularly the lungs, is also conditioned as oxygenated blood is brought to various organs, ensuring that their maximum functioning are ensured. It helps the lymphatic system get rid of numerous kinds of biotoxins that are in the body (Pirisi, 2007).



As the respiratory system is usually impacted by COVID-19 and various yoga practises help to preserve the soundness of this essential system through a variety of poses, breathing and relaxation techniques. These many methods may help to improve lung capacity and overall health by strengthening the immune system (Sharma et al., 2018).

### Asanas work to boost immunity

#### Bhujangasana (Cobra Pose)

It helps expand the heart and lungs and enhance circulation by stretching the chest, lungs, shoulder and belly in Bhujangasana (Cobra Pose). It also helps those with bronchial asthma breathe better (Gupta, 2019).

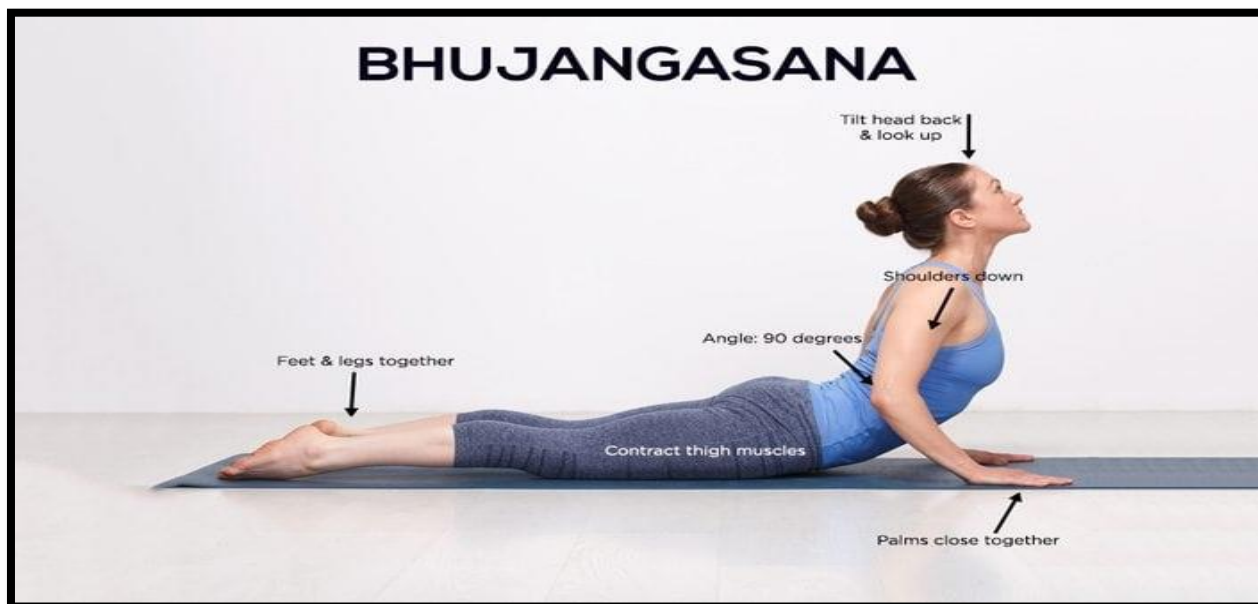


FIGURE-1: BHUJANGASANA

#### Matsyasana (fish position)

Matsyasana (fish position) is an immunity-boosting asana that also helps to detoxify the body and boosts energy levels. It also has the ability to clear congestion from the nose and sinuses (India, 2020).

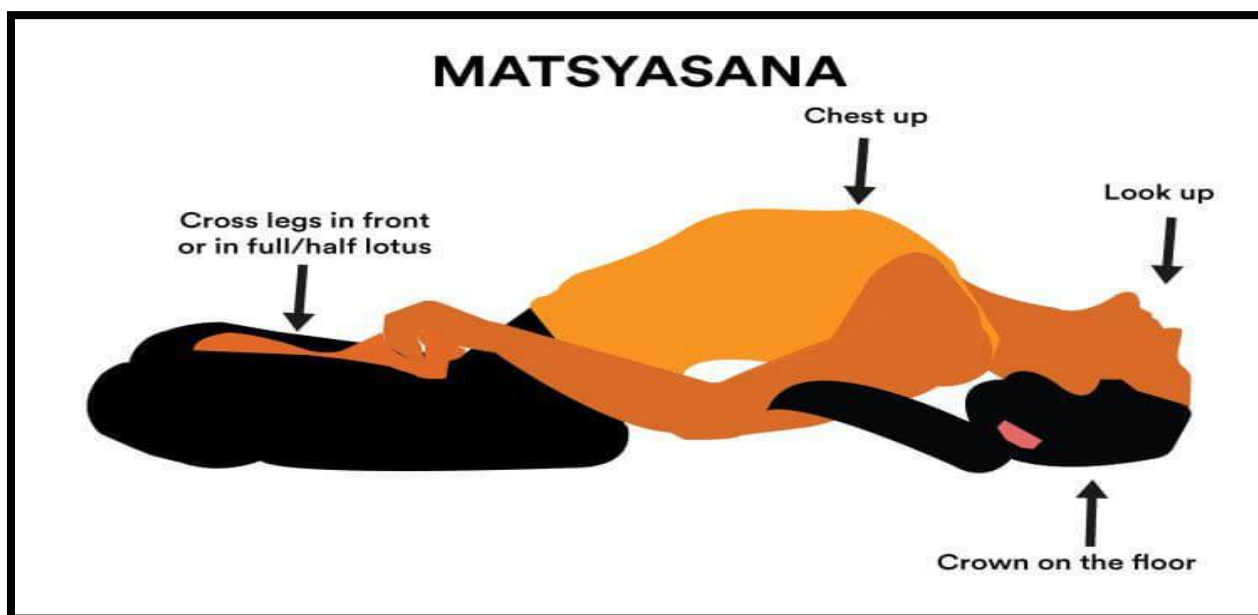
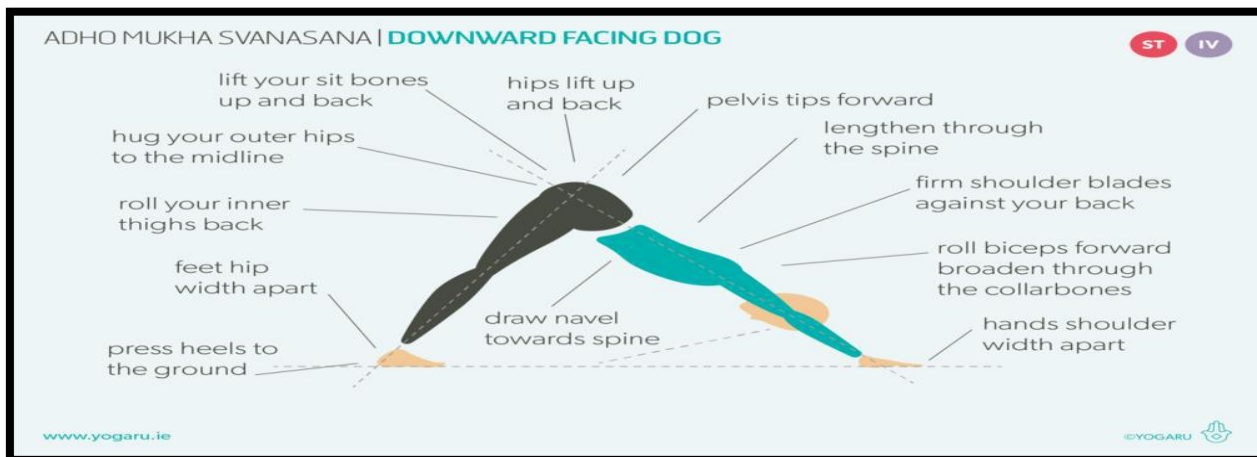


FIGURE- 2: MATSYASANA



**Adho-Mukha Svanasana (downward-facing dog):**

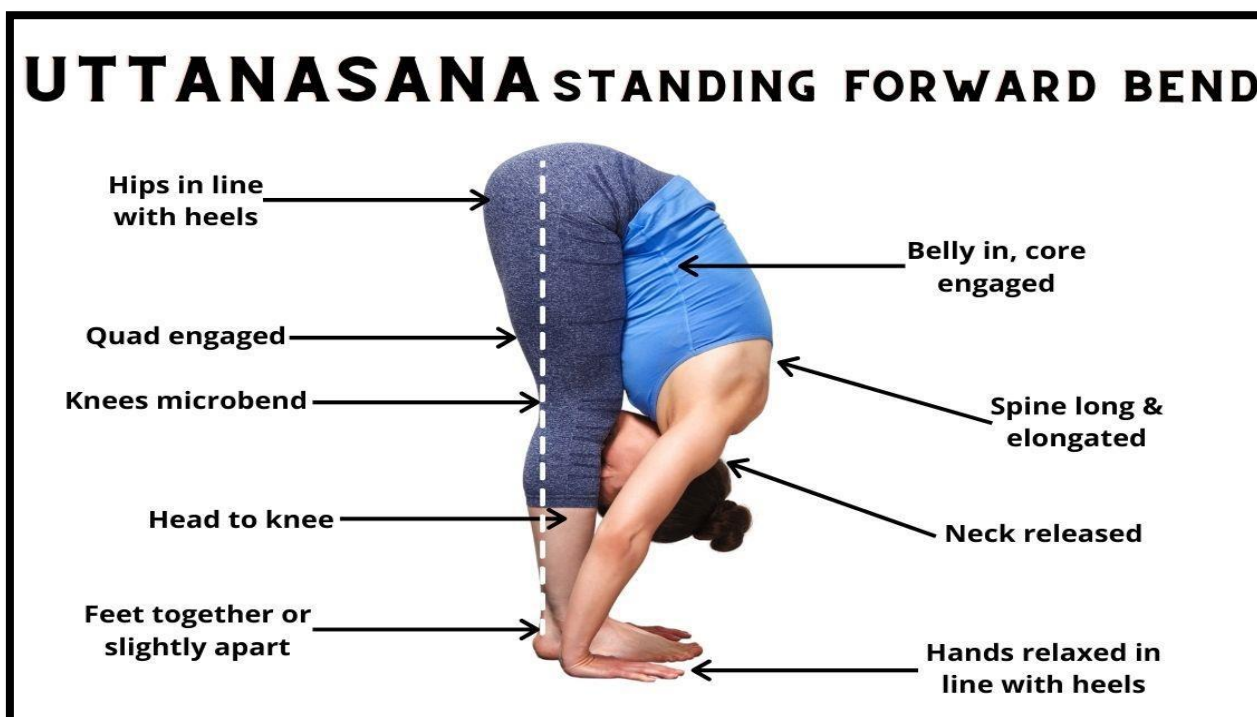
This position increases blood circulation while transferring energy throughout the body (Kapoor, 2016).



**FIGURE-3: ADHO-MUKHA SVANASANA**

**Uttanasana (forward bend)**

In this Yoga asana (forward bend), the sinuses and mucous membranes are protected, which is the first line of defence.



**FIGURE-4: UTTANASANA**

**Dhanurasana (bow position)**

This Yoga practise improves the flow of WBCs by applying pressure to the abdomen and improving blood circulation to the abdominal organs. It strengthens and improves the digestive system. The tiny WBC fights invaders and improves your overall health and immunity because the digestive system contains many lymphocytes. Tones up the arms and legs using Dhanurasana's special stance (Phelamei, 2020)



**FIGURE-5: DHANURASANA**

In a nutshell, various Asanas nourish specific organs, particularly the lungs, by raising the elastic recoil of the lungs and boosting the oxygen content in the blood. It also helps to build up the muscles and tissues of the various organs by allowing for more relaxed breathing without increasing the respiratory rate.

## 8. CONCLUSION:

In light of the vast number of persons afflicted by COVID and the current availability of little scientific evidence, it will be crucial to construct brief and comprehensive exercise programmes. It's been known for centuries that yogic asanas and pranayam are useful for both physical activity and psychological healing.

Because Yoga is a cheap and accessible exercise that anyone can do at home, it's a no-brainer. Yoga can be practised by everyone, regardless of age. After a proper demonstration and under the guidance of a professional, it becomes suitable for everyone. When faced with a pandemic like COVID-19, a comprehensive yoga practise regimen can serve as an everlasting, holistic, very cost-effective, and simple model for maintaining good health and repairing the body.

## REFERENCES:

1. Andrea Demeco, including Nicola Marotta, M. Barletta, Cinzia Marinaro, Annalisa Petraroli, and Antonio Amendolia, (2020). A study of the literature on patient rehabilitation following infection with COVID-19 was conducted. *International Journal of Medical Research*. 48. 030006052094838. 10.1177/0300060520948382.
2. Maheshkumar Kuppusamy, Dilara Kamaldeen Pitani, Ravi, Julius Amaldas, and S. Poonguzhali were the other authors on this paper (2017). A thorough review of the health benefits of Bhramari Pranayama. 10.1016/j.jtcme.2017.02.003 *Journal of Traditional and Complementary Medicine*. 8. Background
3. Pallav Sengupta was a great scholar (2012). A current review of the health effects of yoga and pranayama. *Preventive medicine: an international journal*, 3, 444-548.
4. Ahmed, H., Patel, K., Greenwood, D. C., Halpin, S., Lewthwaite, P., Salawu, A., Eyre, L., Breen, A., O'Connor, R., Jones, A., and Sivan, M. (2020). Long haul clinical results in overcomers of serious intense respiratory condition and Middle East respiratory disorder Covid episodes after hospitalization or ICU confirmation: An efficient survey and meta-investigation. *Diary of recovery medication*, 52 (5), jrm00063. <https://doi.org/10.2340/16501977-2694>



5. Balachandar, V., Mahalaxmi, I., Subramaniam, M., Kaavya, J., Senthil Kumar, N., Laldinmawii, G., Narayanasamy, A., Janardhana Kumar Reddy, P., Sivaprakash, P., Kanchana, S., Vivekanandhan, G., and Cho, S. G. (2020). Follow-up examinations in COVID-19 recuperated patients - is it required?. *The Science of the absolute climate*, 729, 139021. <https://doi.org/10.1016/j.scitotenv.2020.139021>
6. Bi, L., and Triadafilopoulos, G. (2003). Exercise and gastrointestinal capacity and sickness: a proof based survey of dangers and advantages. *Clinical gastroenterology and hepatology: the authority clinical practice diary of the American Gastroenterological Association*, 1 (5), 345–355. [https://doi.org/10.1053/s1542-3565\(03\)00178-2](https://doi.org/10.1053/s1542-3565(03)00178-2)
7. Brunner, D., Abramovitch, A., and Etherton, J. (2017). A yoga program for intellectual upgrade. *PloS one*, 12 (8), e0182366. <https://doi.org/10.1371/journal.pone.0182366>
8. Buttar, H. S., Li, T., and Ravi, N. (2005). Anticipation of cardiovascular infections: Role of activity, dietary intercessions, stoutness and smoking end. *Trial and clinical cardiology*, 10 (4), 229–249.
9. Camargo, C. A., Jr, Budinger, G. R., Escobar, G. J., Hansel, N. N., Hanson, C. K., Huffnagle, G. B., and Buist, A. S. (2014). Advancement of lung wellbeing: NHLBI Workshop on the Primary Prevention of Chronic Lung Diseases. *Records of the American Thoracic Society*, 11 Suppl 3 (Suppl 3), S125–S138. <https://doi.org/10.1513/AnnalsATS.201312-451LD>
10. Cao, Y., Liu, X., Xiong, L., & Cai, K. (2020). Imaging and clinical components of patients with 2019 novel Covid SARS-CoV-2: A methodical audit and meta-examination. *Diary of clinical virology*, 10.1002/jmv.25822. Advance internet based distribution. <https://doi.org/10.1002/jmv.25822>
11. Caruso, P., Longo, M., Esposito, K., and Maiorino, M. I. (2020). Type 1 diabetes set off by COVID-19 pandemic: An expected flare-up? *Diabetes research and clinical practice*, 164, 108219. <https://doi.org/10.1016/j.diabres.2020.108219>
12. Choudhury, H., Pandey, M., Hua, C. K., Mun, C. S., Jing, J. K., Kong, L., Ern, L. Y., Ashraf, N. A., Kit, S. W., Yee, T. S., Pichika, M. R., Gorain, B., and Kesharwani, P. (2017). A report on normal mixtures in the cure of diabetes mellitus: A methodical survey. *Diary of conventional and integral medication*, 8 (3), 361–376. <https://doi.org/10.1016/j.jtcm.2017.08.012>
13. Demeco, A., Marotta, N., Barletta, M., Pino, I., Marinaro, C., Petraroli, A., Moggio, L., and Ammendolia, A. (2020). Recovery of patient's post-COVID-19 disease: a writing audit. *Diary of International Medical Research*. <https://doi.org/10.1177/0300060520948382>
14. Gothe, N. P., and McAuley, E. (2016). Yoga Is on par with Stretching-Strengthening Exercises in Improving Functional Fitness Outcomes: Results From a Randomized Controlled Trial. *The diaries of gerontology. Series A, Biological sciences and clinical sciences*, 71 (3), 406–411. <https://doi.org/10.1093/gerona/glv127>
15. Guo, J., GAO, C., Xin, H., Li, J., Li, B., Wei, Z., and Yue, Y. (2019). The utilization of "chest area yoga" in old patients with intense hip break: a forthcoming, randomized, and single-blind review. *Diary of muscular medical procedure and examination*, 14 (1), 250. <https://doi.org/10.1186/s13018-019-1295-6>
16. Gutenbrunner C, Stokes EK, Dreinhöfer K, et al. Why Rehabilitation should have need during and after the COVID-19-pandemic: A position explanation of the Global Rehabilitation Alliance. *J Rehabil Med*. 2020; 52 (7):jrm00081. Distributed 2020 Jul 30. doi:10.2340/16501977-2713
17. Halpin, S. J., McIvor, C., Whyatt, G., Adams, A., Harvey, O., McLean, L., Walshaw, C., Kemp, S., Corrado, J., Singh, R., Collins, T., O'Connor, R. J., and Sivan, M. (2020). Postdischarge manifestations and recovery needs in overcomers of COVID-19 disease: A cross-sectional assessment. *Diary of clinical virology*, 10.1002/jmv.26368. Advance internet based distribution. <https://doi.org/10.1002/jmv.26368>
18. Ho-Yen D. O. (1990). Patient administration of post-viral weakness condition. *The British diary of general practice: the diary of the Royal College of General Practitioners*, 40 (330), 37–39.
19. Iannaccone, S., Castellazzi, P., Tettamanti, A., Houdayer, E., Brugliera, L., de Blasio, F., Cimino, P., Ripa, M., Meloni, C., Alemanno, F., and Scarpellini, P. (2020). Job of Rehabilitation Department for Adult Individuals with COVID-19: The Experience of the San Raffaele Hospital of Milan. *Files of actual medication and recovery*, 101 (9), 1656–1661. <https://doi.org/10.1016/j.apmr.2020.05.015>
20. Jácome, C., Marques, A., Oliveira, A., Rodrigues, L. V., and Sanches, I. (2020). Pneumonic telerehabilitation: A global call for activity. *Pulmonology*, S2531-0437 (20)30135-5. Advance web-based distribution. <https://doi.org/10.1016/j.pulmoe.2020.05.018>