Can Yogic Breathing Techniques Like Simha Kriya and Isha Kriya Regulate COVID-19-Related Stress?

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The global impact of Coronavirus Disease 2019 (COVID-19) is tremendous on human life, not only affecting the physical and mental health of population but also impacting the economic system of countries and individual itself. The present situation demands prompt response toward COVID-19 by equipping the humans with strategies to overcome the infection and stress associated with it. These strategies must not only be limited to preventive and therapeutic measures, but also aim at improving immunity and mental health. This can be achieved by yogic breathing techniques. In this perspective, we emphasize the importance of yogic breathing, Simha Kriya and Isha kriya, the simple yet effective breathing techniques.

Keywords: COVID-19, Isha Kriya, novel coronavirus, Simha Kriya, yogic breathing, breathing techniques

INTRODUCTION

Traditional yogic systems that involve breathing exercises (Pranayama), yoga postures (Asanas), chants and meditation have been known to reduce physical and mental stress, enhance lung functions, and immunity (Hakked et al., 2017). Mindful meditation for a single day is able to decrease the gene expression of histone deacetylase genes (HDAC 2, 3, and 9) and pro-inflammatory genes (RIPK2 and COX2) in experienced meditators (Kaliman et al., 2014). Interestingly, Yoga practice has shown to decrease the oxidative stress markers and up-regulate the expression of telomerase genes, such as telomerase reverse transcriptase and telomerase RNA, suggesting increased cellular viability and reduced cellular aging (Duraimani et al., 2015). Studies have shown that Yoga therapy/meditation can improve health and well-being of a diseased individual by reducing stress besides boosting the immune response (Thirthalli et al., 2013; Danhauer et al., 2019; Tang et al., 2020; Venkatesh et al., 2020). Mindfulness-based cognitive therapy can significantly reduce stress, depression and anger, when administered in-person, or virtually (Schanche et al., 2020; Kuo et al., 2021; Orosa-Duarte et al., 2021; Strauss et al., 2021). Similar to Yoga, mindfulness-based

Abbreviations: ACE2, Angiotensin-converting enzyme 2; ARDS, Acute respiratory distress syndrome; CD4, Cluster of differentiation 4; CD8, Cluster of differentiation 8; COVID-19, Coronavirus Disease 2019; COX2, Cyclooxygenase 2; HCWS, Health care workers; HDAC2, Histone Deacetylase 2; HDAC3, Histone Deacetylase 3; HDAC9, Histone Deacetylase 9; LDBT, Isha kriya or long duration breathing technique; MCP-1, Monocyte chemoattractant protein-1; RIPK2, Receptor-interacting serine/threonine-protein kinase 2; SARS, Severe Acute Respiratory Syndrome; SARS-CoV-2, Severe acute respiratory syndrome coronavirus 2/novel coronavirus; SDBT, Simha kriya or short duration breathing technique.
techniques also have immune modulatory effects (Reich et al., 2017; Andrés-Rodríguez et al., 2019).

Some studies suggest the role of yogic controlled breathing in reducing the stress levels, controlling mood fluctuations such as anxiety and depression, and at the same time improving quality of life by motor co-ordination, cognitive performance, heart rate variability, and more (Bernardi et al., 2000; Sharma et al., 2014; Gonçalves et al., 2016; Erdoğan Yüce and Taşcı, 2020). Systolic and diastolic blood pressure is improved immediately after practicing Pranayama (Pramanik et al., 2009; Bhavanani et al., 2011). It is notable that practicing Yoga, especially breathing techniques, may be beneficial to control anxiety, stress and to some extent modulate immune response. However, validating such technique in a clinical set up is obligatory.

Enhanced anxiety and stress levels were reported worldwide in Coronavirus Disease 2019 (COVID-19) pandemic amongst health care workers (HCWs), quarantined individuals (suspected cases), convalescent individuals and COVID-19 positive cases due to sudden rise in cases and inability to manage COVID-19 with medication available in the early stages of pandemic (Luo et al., 2020; Cornell et al., 2020; Pfefferbaum and North, 2020; Halperin et al., 2021). Psychological stress has been reported to increase during the lockdowns, quarantine periods and after stay-at-home orders (Ozamiz-Etxebarria et al., 2020). Anxiety and stress have also increased among people due to recent vaccination drive; some are anxious while waiting for their first or second vaccine shot while others have doubts on efficacy of vaccines, which are still under trial. Psychological stress is a known factor which is detrimental to immune modulation and stress can diminish the immune response post vaccination (Glaser et al., 1998; Segerstrom and Miller, 2004; Pedersen et al., 2009; Madison et al., 2021). It is widely believed that stress associated with COVID-19 may worsen the severity of infection and may render otherwise healthy individuals susceptible to COVID-19 (Cohen, 2021).

Novel coronavirus disease of 2019, often referred as COVID-19 was declared pandemic in March, 2020 (Cucinotta and Vanelli, 2020). Since the virus was reported, there are 119,220,681 confirmed cases of COVID-19, including 2,642,826 deaths worldwide as of 5:13 pm CET, 14 March 2021 (WHO, 2020b). COVID-19 is caused by SARS-CoV-2 (novel coronavirus), which has 82% genome similarity with Severe Acute Respiratory Syndrome (SARS) causing virus, SARS-CoV (Chan et al., 2020). SARS-CoV-2 spreads rapidly than SARS-CoV and replicates actively in upper respiratory tract (Hou et al., 2020; Sungnak et al., 2020; Wölfel et al., 2020; Ziegler et al., 2020).

Pneumocytes in lungs are invaded by SARS-CoV-2 leading to collapse of the air sacs (Zhao et al., 2010). An immune response is induced as macrophages and neutrophils rush to the site, initiating inflammation that lead to pneumonia (Wang et al., 2020; Zeng et al., 2020). Death in severe cases occurs because of pneumonia and acute respiratory distress syndrome, where deposition in alveoli and small blood vessels around alveoli is formed impairing the gaseous exchange (Welty-Wolf et al., 2002; Levi et al., 2003; Moore et al., 2020; Tian et al., 2020). Hence, managing the immune response could be one of the treatment strategies for COVID-19.

Although with low mortality rates, there is accelerating rise in number of deaths because of rapid transmission and various mutated strains of SARS-CoV-2 (Fang et al., 2021; Leung et al., 2021; Ozono et al., 2021), resulting in stress among people. The treatments that are or were practiced for COVID-19 include Hydroxychloroquine, Remdesivir, Lopinavir-Ritonavir combination with or without interferon, Dexamethasone and convalescent plasma therapy (Antinori et al., 2020; Grein et al., 2020; Hung et al., 2020; Okour et al., 2020; Valk et al., 2020). Remdesivir is the only United States Food and Drug Administration (FDA) approved drug, which can be used in combination with Baricitinib for faster recovery (Kalil et al., 2020).

COVID-19 is a public health emergency; hence, FDA has issued Emergency Use Authorization (EUA) to a few vaccines, which are under trial. In December 2020, two vaccines, i.e., Pfizer-BioNTech COVID-19 Vaccine and Moderna COVID-19 Vaccine were granted EUA from FDA. Pfizer-BioNTech COVID-19 Vaccine was the first to receive EUA from WHO followed by AstraZeneca/Oxford COVID-19 vaccine, manufactured by the Serum Institute of India and SKBio (WHO, 2020a). Two prominent vaccines namely, AstraZeneca/Oxford COVID-19 under the local name of Covishield and Covaxin, developed by Bharat Biotech, India are being administered in India.

Precautionary measures such as N-95 or regular masks, hand-washing, use of sanitizers and social distancing can be effectively supplemented with vaccination and immune enhancing measures such as a good diet, physical exercises, yogic breathing exercises, and meditative techniques including mindfulness. We hypothesize that Yoga, especially the breathing technique, maybe instrumental in COVID-19 management as an adjunct approach. In this article we have discussed the psychological and physiological improvements achieved by practicing Yoga, including Pranayama, or meditation or both and tried to emphasize its role in COVID-19 management.

YOGA AND BREATHING TECHNIQUES IN REDUCING THE DISEASE BURDEN

Yogic Breathing Techniques and Their Effects on Human Systems

Yoga originated in ancient India and includes physical, mental, and spiritual practices with an explicit emphasis on different breathing patterns. Yogic breathing in a controlled manner known as Pranayama is one of the eight limbs of traditional yoga. Furthermore, Pranayamas themselves are of eight types, (1) Surya Bhedana or Sun-breathing Breath or Right Nostril Breathing, (2) Ujjayi or Victorious or Ocean Breath, (3) Sheetkari or Hissing Breath, (4) Sheetali or Cooling Breath, (5) Bhastrika or Bellows Breath, (6) Bhramari or Humming Bee Breath, (7) Moorchha or Swooning Breath, and (8) Plavini or Floating Breath (Muktibodhananda, 2012). According to “Hatha Yoga Pradipika,” these Pranayamas have various benefits on the mind and body as a whole (Muktibodhananda, 2012).
Surya Bhedana Pranayama increases heat in body; it helps body vitality, treat anxiety, depression and lack of energy. Ujjayi Pranayama is good for throat, cardio-respiratory, nervous and digestive systems. Sheetkari Pranayama calms mind and reduces negative emotions, improves immunity, memory, purifies blood and refreshes the body (Thanalakshmi et al., 2014). Sheetali Pranayama can be beneficial in summers as it cools down the mind and body. It also reduces bad breath, regulates blood pressure and elevates mood. Sheetkari and Sheetali Pranayamas reduce blood pressure in hypertensives (Shetty, 2017). Bhashrika Pranayama energizes mind and body by maximizing lung capacity. It helps in respiratory problems such as sinus, bronchitis and it also improves awareness and perceptive power of senses (Budhi et al., 2019). Bhamrani Pranayama relieves tension, anger and anxiety, reduces blood pressure, diminishes headache and migraines, and improves concentration and memory (Kuppusamy et al., 2018). Moorchha Pranayama promotes happiness of mind, helps the mind to draw inward, removes body fat and reduces muscle weakness. Plavini is an advanced Pranayama, which increases the body capacity to sustain without food and water for several days; helps to detoxify the body and decreases stress.

Yogic Breathing on Stress Levels and Immunity

Emerging studies suggest the positive role of Pranayama in the regulation of hypothalamic-pituitary-adrenal axis and inflammatory processes (Kiecolt-Glaser et al., 2010; Kaliman et al., 2014; Bower and Irwin, 2016). They may serve as adjunct to modern approaches if not as a new avenue for the non-pharmacological treatment regime. Regular Yoga practice improves mental health, by increasing mental calmness, reducing stress, improving physical health, breathing and sleep (Cartwright et al., 2020; Haller et al., 2020; La Torre et al., 2020; Sahni et al., 2021). Meditation and mindfulness also improve psychological well-being and reduce stress and anxiety (Kwok et al., 2019; Hilcove et al., 2020; Ofei-Dodoo et al., 2020; Sadhasivam et al., 2020). These benefits are documented in the ancient Indian texts; however, the need to establish these benefits by using modern tools has triggered many scientific studies on Yoga, meditation and breathing exercises. Table 1 shows recent trial studies, which have shown reduction in stress, anxiety or depression in different study set up.

Yoga has been shown to improve quality of life, reduce fatigue and sleep disturbances in breast cancer patients (Cramer et al., 2017). Yoga protocol designed in India, specifically to manage diabetes can reduce co-morbidity of dyslipidemia in diabetic patients (Nagaratna et al., 2019b). Further, Yoga practice was also able to limit stress-related inflammation in women (Kiecolt-Glaser et al., 2010). Yoga intervention, including Pranayama and Asana, increases CD4, a marker of helper T cells, in HIV patients indicating improved immunity, which is prominently hampered in HIV (Joseph et al., 2015). Similarly, immunity improved in HIV-positive children/adolescents after Yoga intervention, indicated by elevation in CD4 and shifting of CD4/CD8 ratio in the normal range (Chandra et al., 2019). The pro-inflammatory cytokines IL-1β, IL-8, and monocyte chemotactic protein-1 (MCP-1) levels were reportedly reduced in the Yoga intervention (Pranava Pranayama) group (T'Wal et al., 2016). It is known that IL-1β induces the brain cyclooxygenase-2 levels, which in turn has a vital role in the stress and pain management (Gurung and Kanneganti, 2015). However, it is also important to consider the role of IL-1β as an anti-inflammatory target for chronic obstructive pulmonary disease (COPD; Dhimolea, 2010). On the other hand, IL-8, a neutrophil chemoattractant, is known to be elevated in the chronic pulmonary disorder patients including COPD, cystic fibrosis, acute respiratory disorder syndrome and asthma (Aggarwal et al., 2000; McGarvey et al., 2002). MCP-1 is known for its role in activation by macrophages, monocytes, lymphocytes, and airway epithelial cells (Lundien et al., 2002). Enhanced levels of MCP-1 have chemotactic activity on monocytes, enhance the T cells activity (Carr et al., 1994), and stimulate transforming growth factor-β and collagen synthesis (Gharacee-Kermani et al., 1996; Hogaboam et al., 1999). In rheumatoid arthritis, Yoga affects the psycho-neuro-immune axis by reduction in inflammatory cytokines and improvement in mind-body communicative markers and quality of life; disease activity was also reduced in yoga group (Gautam et al., 2020).

Breathing techniques and meditation have shown to decrease inflammation in Axial Spondyloarthritids (Buijze et al., 2019). Breathing techniques, especially the respiratory techniques improve lung functions, and immune response in bronchial asthma patients (Asimakos et al., 2018). Bhashrika Pranayama, the most popular Pranayama, improves lung function in healthy individuals (Kuppusamy et al., 2018). Shambhavi Mahamudra kriya, a 21-min Isha yoga meditation from the Isha foundation, India, include deep breathing and meditation reducing stress as was measured by Perceived Stress Scale (Peterson et al., 2017). Other breathing techniques that improve the pulmonary rehabilitation in cases of COPD include the diaphragmatic and pursed-lip breathing (Martarelli et al., 2011; Valenza et al., 2014). Both the techniques results in inspirational capacity, slow breathing rate, longer exhalation time, improved oxygen saturation, lung emptying, and dynamic hyperinflation reduction in the COPD cases (Casaburi et al., 1997; Kaminsky et al., 2017).

Studies have shown improved ventilatory function in individuals performing yoga or breathing exercise. Improved ventilatory function was reported from lowered respiratory rate and increase in tidal volume, forced vital capacity, increase in forced expiratory volume at the end of 1st second, maximum voluntary ventilation, peak expiratory flow rate and breath holding time (Vieira et al., 2014; Joo et al., 2015; Alaparthi et al., 2016; Csepregi et al., 2019). Learning to adopt new breathing techniques that help to improve lung capacity, volume and function may play a role in enhancing disease recovery, such as flu, common cold and COVID-19.

ISHA KRIYA: A SIMPLE BREATHING TECHNIQUE

Yoga uses the traditional wisdom of using breathing for self regulation. Isha Foundation, established by Sadhguru, a yogi, has
TABLE 1 | Stress and Anxiety reduction by Yoga and mindfulness.

| Clinical trial studies | Pubmed ID | Sample size | Age, years | Disorder or disease targeted or study group type | Technique | Effect on psychological stress, anxiety, or depression |
|------------------------|-----------|-------------|------------|-------------------------------------------------|-----------|-----------------------------------------------------|
| Divya et al., 2021. Global Advances in Health and Medicine | 33623726 | 92 | 43.1 ± 11.1 | Health care workers | Sudarshan Kriya Yoga, workshop of 4 days followed by 40 days of self-practice | Stress, Anxiety and depression were reduced. |
| Sadhasivam et al., 2020. Evidence-Based Complementary and Alternative Medicine | 32595741 | 348 | – | Healthy participants | Bhava Spandana Program (Yoga and meditation retreat) for 4 days | Anxiety and depression were reduced. Quality of life improved |
| Haller et al., 2020. Current Pharmaceutical Design | 33308110 | 57 | 51.3 ± 10.5 | Breast cancer | Yoga and mindfulness technique for 66 h | Stress, Anxiety and depression were reduced. |
| Marshall et al., 2020. International Journal of Environmental Research and Public Health | 32825677 | 13 | 20.8 ± 0.8 | Physically active and healthy | Meditative (Hatha style) yoga for 30 min | Stress was reduced |
| Pattnaik et al., 2020. Journal of Family Medicine and Primary Care | 33110832 | 200 | – | Oral cancer patients | Yoga for 1 month | Stress was reduced |
| McDonnell et al., 2020. Integrative Cancer Therapies | 33118443 | 49 | Survivors = 66.5 ± 5.5 Family member = 60.2 ± 14.1 | Survivors of non-small-cell lung cancer | Mindfulness-based intervention, Breathe Easier for 2 months | Stress, Anxiety and depression were reduced. |
| Grahn Kronhed et al., 2020. Journal of Alternative and Complementary Medicine | 32543212 | 15 | 71.8 (median 72, range 63–82) | Osteoporotic Vertebral Fracture | Yoga and mindfulness technique, once a week for 10 weeks | Stress was reduced |
| Nirwan et al., 2020. Journal of Complementary and Integrative Medicine | 32554833 | – | – | Winter expedition members of Indian Scientific Antarctic Expedition | Yoga for 10 months | Improvement in stress-related blood markers |
| Sharma et al., 2020. Journal of Alternative and Complementary Medicine | 32608989 | Yoga, n = 33 Control, n = 33 | Yoga = 53.2 ± 11.6 Control = 51.5 ± 8.2 | Cardiovascular diseases | Asana, Pranayama and relaxation technique, 3 days per week for 12 weeks | Anxiety and depression were reduced. Quality of life improved |
| Goldstein et al., 2020. Journal of American College Health | 32667254 | 37 | 20.7 ± 3.2 | Undergraduate and graduate students | Sudarshan Kriya Yoga for 4 days | Stress was reduced |

(Continued)
TABLE 1 | Continued

| Clinical trial studies | Pubmed ID | Sample size | Age, years | Disorder or disease targeted or study group type | Technique | Effect on psychological stress, anxiety, or depression |
|------------------------|-----------|-------------|------------|-----------------------------------------------|-----------|--------------------------------------------------|
| La Torre et al., 2020. Journal of Clinical Medicine | 32272758 | 40 | 47.3 ± 10.9 | Health care workers | Yoga and mindfulness technique for 4 weeks | Stress and Anxiety were reduced |
| Verma et al., 2020. Journal of Education and Health Promotion | 32318598 | 33 | 52.4 ± 5.8 | Healthy participants (principal) | Yoga for 105 min, twice a day for 1 week | Stress was reduced |
| Ofie-Dodoo et al., 2020. Journal of Occupational and Environmental Medicine | 32358474 | 43 | – | Health care workers | Mindfulness-based yoga for 8 weeks | Stress and Anxiety were reduced |
| Cartwright et al., 2020. Complementary Therapies in Medicine | 32440386 | 10 | 53.6 ± 13.2 | Rheumatoid arthritis | Yoga for 16 weeks | Anxiety and depression were reduced. Quality of life improved |
| Hilcove et al., 2020. Journal of Holistic Nursing | 32460584 | Yoga, n = 41 Control, n = 39 | Yoga = 42.4 (24 to 69) Control = 42.5 (24 to 64) | Health care workers | Mindfulness-based yoga for 6 weeks | Stress was reduced |
| Tong et al., 2020. Journal of American college health | 31944986 | Study1, n = 191 Study2, n = 143 | Study1, 20.0 ± 1.4 Study2, 19.8 ± 1.4 | Healthy undergraduates | Yoga A 60 min session in Study 1 and 12 weeks intervention in Study 2 | Stress was reduced |
| Bressington et al., 2019. Journal of Affective Disorders | 30711868 | Yoga, n = 23 Control, n = 27 | Yoga = 46.3 ± 12.8 Control = 49.3 ± 9.1 | Depression | Laughter Yoga, 8 sessions over 4 weeks | Depression was reduced |
| Kwok et al., 2019. JAMA Neurology | 30958514 | Yoga, n = 71 Control, n = 67 | Yoga = 63.7 ± 8.2 Control = 65.5 ± 9.3 | Idiopathic Parkinson disease | Mindfulness-based yoga, 90 min for 8 weeks | Anxiety and depression were reduced |
| Miyoshi, 2019. Journal of Occupational Health | 31368154 | 20 | 20 to 30 | Health care workers | Yoga for 4 weeks | Stress was reduced |
| Bisht et al., 2019. Annals of Neurosciences | 31975776 | 86 | 31.4 ± 7.3 | Parents of retinoblastoma patients | Yoga based lifestyle intervention for 12 weeks | Stress was reduced |

The above list includes studies reported from 2019 till present.

devolved and propagated the practice of simple yogic breathing practices including *Isha kriya* or long duration breathing technique, *Simha kriya* or short duration breathing technique, and *Shambhavi Mahamudra Kriya* (*Table 2*). A *kriya* is a yogic action or an inner technique, like controlling the breath. The most remarkable characteristic feature of these *kriyas* is that they are easy to learn and practice with simple instructions. They are free and app guided. *Isha kriya* is recommended to be done on empty stomach. Practicing *Isha kriya* calms mind and body, reduces stress, anxiety, and depression, energizes body, improves health and it is said to empower an individual in handling unpleasant situation around himself/herself. Recent interest is emerging on the efficacy and understanding the biological/physiological/psychological mechanisms of *Isha Kriya*. Although more research is required, the available literature points out that there is no side effect of *Isha kriya* (Narayanan et al., 2020); practicing it regularly, twice a day, is more fruitful for health. Interestingly, mood disturbances can be reduced in HCW by single-time *Isha kriya* practice shown in a pilot study examining the mood changes before and...
after practice in stressed HCW from surgical grand rounds and an anesthesia conference (Rangasamy et al., 2019). Isha followers often claim that individuals practicing Isha kriya are less susceptible to common cold and flu. However, it needs to be investigated.

Simha kriya, another kriya developed by Sadhguru, is said to boost the immune system, increase lung capacity, purifies body and the mind. It can even help identify individuals with respiratory problem as they are unable to perform Simha kriya after 4–5 days of regular practice. However, there are yet no direct studies reported in the literature.

Shambhavi Mahamudra Kriya is the most studied among the three kriyas, yet it has not been adequately investigated. It is a combination of Pranayama, yogic postures and meditation, again not prescribed in Yogic literature. A few studies have suggested that increase in the heart rate variability, sympathetic tone and vagal afferents balance is associated with Shambhavi Mahamudra Kriya (Selvaraj et al., 2008; Peterson et al., 2017). Though additional studies are warranted, one of the studies provides enough evidence of the relaxation with decreased stress and increased well-being (Sinha et al., 2013; Peterson et al., 2017).

Due to COVID-19 pandemic interest in such techniques has re-emerged especially with regard to the efficacy and understanding the biological/physiological mechanisms of Isha Kriya. In contrast to above kriyas, Sudarshan kriya (SKY), evolved by Art of Living, is well studied and has shown to reduce stress and improve autonomic nervous system, immunity and well-being (Sharma et al., 2003; Brown and Gerbarg, 2005; Zope and Zope, 2013; Chandra et al., 2017; Mathersul et al., 2019). SKY can improve depression and can be beneficial for Post-traumatic stress disorder (Janakiramaiah et al., 2000; Katzman et al., 2012; Seppälä et al., 2014). SKY is beneficial in maintaining oxygen saturation in the practitioners at extreme high-altitude environment and thus reduces the risk of developing high-altitude related disorders (unpublished data). A recent study has shown reduction in stress, anxiety and depression among HCWs during COVID-19 pandemic after SKY intervention (Divya et al., 2021).

Such modifications based on yogic knowledge, require longitudinal randomized trials in comparison to established techniques for efficient integration (Nagendra et al., 2019; Nagarathna et al., 2019a). These breathing techniques are taught by different Yoga schools in India like Isha foundation, Art of Living and other such schools. The followers of these foundations constitute large numbers, either using these breathing techniques or obtaining training in the same. Therefore, it is easy to recruit a sufficient sample size and test such techniques as compared to the basic Yoga techniques. These kriyas often face barriers as there

| TABLE 2 | Simple Yogic breathing practices. |
| --- | --- |
| **ISHA KRIYA OR LONGER DURATION BREATHING TECHNIQUE (LDBT)** | ![Image](https://youtu.be/K4hCvdDn7Zc) |
| **Time interval:** | ∼12–18 min |
| **Preparation:** | Crossed leg posture with straight spine, hands on thighs with palms facing upward, face slightly upward, mild focus between the eyebrows |
| **3 Stages** | |
| Stage 1 | Inhale/Exhale, ∼7–11 min | While inhaling mentally saying: I am not the body |
| | While exhaling mentally saying: I am not even the mind |
| Stage 2 | Utter “aa” 7 times, ∼1 min | Producing the sound from the navel region with mouth wide open. Not very loud but enough to feel the vibrations produced by the sound |
| Stage 3 | Sit silent for ∼5–6 min | Face slightly upward with mild focus between the eyebrows. |

| **SIMHA KRIYA OR SHORT DURATION BREATHING TECHNIQUE (SDBT)** | ![Image](https://youtu.be/lP1Y1bk1YgU) |
| --- | --- |
| **Time Interval:** | 3–5 min |
| **Preparation:** | Eyes closed, sit with cross legs |
| **3 Stages** | |
| Stage 1 | Powerful inhalation/exhalation 21 times with tongue outside, ∼1–2 min | Constrictions from the throat, No abdominal jerks |
| Stage 2 | Tongue rolled inside by pushing it back, 21 powerful inhalation/exhalation, ∼1–2 min | |
| Stage 3 | Sit relaxed with fullness of breath for ∼30 s – 1 min | Mouth closed, Eyes closed |

Individuals aged <6 years, >70 years or who have any kind of tumor or hemorrhage in brain should do Stage 1 and Stage 2 for 12 times only in SBDT.
is an attempt for their application as a health care technique by
general population (Mishra et al., 2020a,c).

Practicing *Isha Kriya* regularly, twice a day, is advocated to
be fruitful for health. Isha foundation states that individuals
practicing *Isha kriya* are less susceptible to common cold
and flu. Hence, the combination of *Isha kriya* and *Simha
kriya* are often apprised as important non-pharmacological
strategy to manage COVID-19. Researchers recommend
breathing techniques in COVID-19 management by boosting
the immunological response, strengthening respiratory system
and improving the immune response (Feng et al., 2020; Khawam
et al., 2020). The combined practice might improve COVID-
19 by reducing stress, improving immunity, increasing lung
capacity, reducing inflammation, and improving wellbeing.
However, no proven stress reduction or immune enhancement
by administering yogic breathing such as *Isha kriya* has
been shown. Unlike SKY, despite reported benefits from *Isha
kriya* practitioners, comprehensive controlled trials haven’t
been undertaken.

We have earlier reported that pre-diabetics are more stressed
than diabetic patients and a yoga intervention, i.e., Diabetes
Yoga Protocol, which include breathing exercises, can slow
down, if not halt, the conversion of pre-diabetic condition
to diabetics by altering the stress responses (Mishra et al.,
2020b). Thus, successful management of the co-morbidities
may reduce the risk of COVID-19. The aforementioned simple
*kriyas* are designed by Sadhguru to include effectiveness of
modulated breathing in everyday routine and can thus reduce
the risk of co-morbidities such as diabetes, hypertension and
may be COVID-19. A doctor from United Kingdom suggested
simple breathing technique, which is popular online, for getting
relief from COVID-19 by encouraging gaseous exchange and
oxygenation; this technique does not prevent or cure COVID-19
(Hamzelou, 2020).

As it is often argued among Yoga scholars that *Isha kriya* and
*Simha kriya* may be useful for COVID-19 patients, a randomized
pilot study is imperative to study the role of *Isha kriya* and *Simha
kriya* with the biological/physiological therapeutic efficacy. In
order to further evaluate the efficacy of *Isha kriya* and *Simha kriya*
in COVID-19 a randomized case-control trial is in progress (Trial
registration no. CTRI/2020/10/028195).

**PSYCHOLOGICAL STRESS AND IMMUNE RESPONSE**

The first report of immunosuppressive effect of psychological
stress was approximately 50 years ago (Herbert and Cohen,
1993). A meta-analysis of 293 independent studies spanning
30 years has revealed that immunity is affected by acute
and chronic stressors (Segerstrom and Miller, 2004). While
acute stress suppresses some aspects of adaptive immunity
and enhances some parameters of natural immunity, chronic
stress suppresses cellular as well as humoral immunity. Brief
but significant stressors, ranging from student examination to
current COVID-19 pandemic, have potential to suppress the
cellular immunity. Loneliness has also been shown to enhance
stress and inflammation under acute stress conditions (Jaremka
et al., 2013; Ozamiz-Etxebarria et al., 2020). Such observations
may be seen in individuals who are quarantined, COVID-19
positive, convalescent or those suffering from loneliness (during
lockdown), increasing their risk of suffering from severe COVID-
19 infection.

Asthma, the respiratory and common allergic disease of 21st
century, is associated with psychological stress, anxiety and
sadness and has a bidirectional association with panic (Lehrer
et al., 2002; Hasler et al., 2005). Negative emotions such as anger
and hostile behavior have negative effect on physiology including
decline in lung function (Kubzansky et al., 2006). These can be
avoided by Yogic interventions.

Studies have shown that psychological stress can increase
risk of diabetes, upper respiratory infection and cancer, and
has role in progression of cancer (Cohen et al., 2002;
Afrisham et al., 2019). Presence of chronic diseases, especially
respiratory disorder together with stress may enhance the
degree of COVID-19, which may be further aggravated by
presence of obesity. Respiratory function is decreased in
obese due to decreased lung volume and accumulation of
cytokine producing adipocytes (Mafort et al., 2016). It is
to be noted that stress and obesity are interrelated because
stress can lead to obesity (overeating response) or vice-versa
(van der Valk et al., 2018). Nevertheless, both stress and
obesity have adverse effect on respiratory function, which
may increase the risk and severity of COVID-19. Yogic
breathing is an important tool to improve oxygen saturation
(Mason et al., 2013).

Furthermore, psychological stress is associated with enhanced
susceptibility for viral infections (Perez et al., 2012). Natural
killer cells tend to decrease under stress (Ma et al., 2013),
which provides immunity until seroconversion and availability
of IgG and IgM antibodies to neutralize SARS-CoV-2 in
middle or later stages of COVID-19 (Xiang et al., 2020).
Apparently, wound healing is also impaired under stress as
indicated by increased expression of genes related to cell cycle
arrest, apoptosis, and inflammation in wound site neutrophils
(Roy et al., 2005).

Age is another risk factor of COVID-19 as immunity decreases
with age (Nicholson, 2016). Hence, it is evident that presence
of psychological stress in HCWs, quarantined individuals
and COVID-19 positive cases may considerably hamper their
ability to withstand COVID-19, both mentally and physically.
Thus, *Pranayama* and other breathing techniques may play a
substantial role in managing stress and improve immunity that
might be beneficial in managing COVID-19 response, especially
when patient is obese or aged and/or has chronic respiratory or
other disorders. Moreover, use of mask is also an added challenge
to a large number of people who are not able to breathe; thus,
such yogic breathing can help.

We hypothesize that simple and controlled breathing
techniques, such as *Isha kriya* or *Simha kriya*, may have
role in managing COVID-19-related stress and immune
response, which might be helpful in prevention or treatment
as an additional and indirect approach. However, the direct
involvement of Isha kriya or Simha kriya in psychological
DISCUSSION

Yoga may be instrumental in managing COVID-19 related stress and regulate immunity and inflammation. However, it is important to note that the key factors to control COVID-19 are prevention of the contagion, by following standard norms such as use of N-95 or regular masks, hand-washing, use of sanitizers and social distancing. Moreover, vaccines are readily available and administered in almost all countries and trials are about to complete thereby the severity of this pandemic might reduce in coming time. However, emergence of new strains of SARS-CoV-2 is of concern, as the presently available vaccines might be unresponsive toward these strains. Yoga practices, which enhance immune system, apparently reduce inflammation and related stress (either associated with infection or loneliness during quarantine), and may aid in management of COVID-19 patients, convalescent cases and HCWs, require validation through randomized clinical trial.

Immunity is adversely affected by increased stress. Psychological stress is often reported among the COVID-19 positive patients and those recovering from it, quarantined individuals and HCWs (Luo et al., 2020; Ornell et al., 2020; Pfefferbaum and North, 2020; Halperin et al., 2021). Therefore, it becomes crucial not only to improve immunity but also to reduce stress. Breathing techniques are known to improve the lung functions, oxygen saturation and improved cardiovascular functions. Liuzijue exercise that includes controlled breathing was able to improve pulmonary function and quality of life in discharged COVID-19 patients (Tang et al., 2021). The best precautionary approach to cope up with COVID-19 is by enhancing immunity and lung functions. However, lack of specific Yoga modules or kriyas precludes extrapolation of controlled trials and their consequent translation. Several ongoing randomized control trials, including our study, aims to investigate the efficacy of various breathing techniques in COVID-19 (Lai et al., 2020; Weiner et al., 2020; Zhang et al., 2020). Figure 1 summarizes the effects of Yogic breathing techniques.

COVID19 outbreak and immediate requirement of precautionary measures and treatment has resulted in exploration of breathing techniques, including those outside the field of yogic texts. This may also act as a tool to manage COVID-19, especially in mild and moderate cases. However, drugs and vaccine are required to efficiently treat COVID-19. Such breathing techniques are easy to access during the lockdown, including the HCWs, the quarantined and COVID-19 positive patients, through digital platforms. The yoga scholars at Post Graduate Institute of Medical Education and

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**FIGURE 1** | Effects of Yogic breathing and probable advantage in COVID-19. Abbreviations: CD4, cluster of differentiation 4; CD8, cluster of differentiation 8; and MCP-1, Monocyte chemoattractant protein-1.
Research, Chandigarh, India have spearheaded such a digital interface with educational programs that prompt scientific analysis of mindfulness programs via Facebook page, “Yoga Scholar PGIMER”\(^1\). The *Isha kriya* breathing technique was discussed by Sadhguru in one such program\(^2\).

Yogic breathing practice such as *Isha kriya* and *Simha kriya* are said to be simple to learn and do not require special training and supervision to execute. The combined practice only takes 15–20 min. Hence, *Isha Kriya* and *Simha kriya* must be evaluated for their efficacy through controlled trials.

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\(^1\) https://www.facebook.com/YogaScholarPGIMER/

\(^2\) https://www.facebook.com/YogaScholarPGIMER/videos/235392504240583/

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**DATA AVAILABILITY STATEMENT**

Publicly available datasets were analyzed in this study. This data can be found here: https://www.neuroscienceresearchlab.org/.

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**AUTHOR CONTRIBUTIONS**

MR wrote the first draft. BS, PA, and AA contributed to conception and design of the review. PM edited and critically reviewed the manuscript. All authors contributed to manuscript revision, read, and approved the submitted version.
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Conflict of Interest: The authors declare that the research was conducted in the absence of any commercial or financial relationships that could be construed as a potential conflict of interest.

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