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Review Article

Using Pranayama or Yoga Breathing to Mitigate Stress and Anxiety during the COVID-19 Pandemic

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Abstract

The emergence of the novel SARS-CoV-2 virus in December of 2019, and subsequent worldwide spread of the Coronavirus Disease 2019 (COVID-19) has affected the psychological wellbeing of the general public. The impact of social distancing and shelter-in-place policies have exacerbated this stress and anxiety due to the pandemic. It is well-documented that stress and depression can increase the risk respiratory infection and overall physical health. At this unprecedented time, measures to enhance well-being and respiratory function through yoga can help mitigate stress. In this review, we describe the use of Pranayama, a branch of yoga practice, to allay stress and mitigate anxiety related to COVID-19. This yoga breathing method involves regulating the flow of breath consciously by a deliberate process and it involves the stages of inhalation, exhalation and retention of breath. Pranayama assists in mental clarity as well as emotional and physical control. Using illustrations, we have provided the steps on how these techniques can be performed. This easy-to-learn approach can be translated to the inpatient and outpatient settings to be used on a daily basis during the COVID-19 pandemic to ensure well-being among the public.

Keywords: COVID-19; Pandemic; Pranayama; Stress; Yoga; Yoga breathing.

Introduction

The emergence of the novel SARS-CoV-2 virus in December of 2019, and subsequent worldwide spread of the Coronavirus Disease 2019 (COVID-19) has affected the psychological well-being of the general public. The impact of social distancing and shelter-in-place policies have exacerbated this stress and anxiety due to the pandemic [1-4]. It is well-documented that stress and depression can increase the risk respiratory infection and overall physical health [5]. At this unprecedented time, measures to enhance well-being and respiratory function through yoga can help mitigate stress.

The word yoga originated from the Sanskrit word "Yuj" meaning to unite. Yoga is defined as the union of "one" with "many" and thus yoga is described as the union of Athma, the consciousness in living body, with Paramathma, the super consciousness or super soul. Yoga has been practiced in ancient India for more than 10,000 years and is an ancient tool in Hindu culture for attaining and maintaining physical and psychological health. The use of yoga as an adjuvant therapeutic intervention started in late 19th century and the indications and list of benefits of this ancient practice continues to expand [6].

Pranayama or breath control is a branch of yoga practice and is the formal practice of controlling one's breath. 'Prana' refers to the universal life force and 'Ayama' means to regulate or lengthen. Pranayama involves regulating the flow of breath consciously by a deliberate process and it involves the stages of inhalation, exhalation and retention of breath. Pranayama assists in mental clar-

ity as well as emotional and physical control. This practice has wide-reaching and scientifically-proven benefits in the short-term and long-term. It also helps with stress relief and increases one's awareness of the physical body rhythms [7-11]. Some common Pranayamas include Bhastrika, Kapalabhati, and Nadi Shodan Pranayama, and are described below.

In this review, we describe the use of Pranayama, a branch of yoga practice, to allay stress and mitigate anxiety related to COVID-19. This easy-to-learn approach can be translated to the inpatient and outpatient settings to be used on a daily basis during the COVID-19 pandemic to ensure well-being among the public.

Benefits of Pranayama

Correct breathing techniques are essential for a healthy and happy life. By paying attention to our breath, our self-awareness and a sense of calm will emerge. Several studies have shown the effect of Pranayama on calming the mind, reducing worries and anxieties, improving focus and attention and increasing energy, bringing enthusiasm and positivity [8-13]. Pranayama has been suggested to even slow down the aging process and boost the immune system [7,9]. On the physical, emotional and mental levels, there is mounting evidence regarding the many additional benefits of Pranayama [8,13,14]

Pranayama and Immune Function

There is a growing body of knowledge about immunomodulation through the use of appropriate practice of Pranayama. A study performed by Rathore [11] showed that the number of natural killer cell increased after 3 to 6 months of structured yoga practice. The long-term effect of such improvements are unknown but as these cells help eliminate damaged and cancerous cells, the potential for Pranayama as a cancer prevention method may be likely.

Interferon (IFN) Gamma is also secreted from NK cells which helps pro-inflammatory function by activating macrophages and endothelial cells. The patients who practiced structured Hatha Yoga had lower level of IFN-Gamma. Studies also supported reduction in IL6 and TNF –alpha levels in a short-term yoga based lifestyle program [11-13]. Structured yoga has also shown to decrease IL-6, TNF alpha, and IL-1 beta 3 production and hence reduce inflammation [11-13]. Yoga practice has shown to down regulate pro-inflammatory genes and potentially down regulating TNF-R11, IL-1 rA, and CRP [12,13]. Alternative signaling pathways that involve RAS/NF k B seem to be involved in reactivation of different viruses [13].

Pranayama and Emotional Regulation

The link between our breath and emotions is well-described. In 2002, Philippot, et al. [14] reported that mirroring angry, sad or happy breathing patterns can create the corresponding emotional states within us. Similarly, a study performed among engineering students also demonstrated enhanced well-being by use of regulated breathing methods. Harinath, et al. [15] studied the effects of Hatha yoga on psychological profile and noted that yogic practices can be used as psychophysiological stimuli to increase endogenous secretion of melatonin, which, in turn, might be responsible for improved sense of well-being. The key to finding emotional stability from a physiological standpoint lies in our Autonomic Nervous System (ANS). The ANS acts largely unconsciously and regulates our respiratory system, among other things.

Yoga techniques that act on the nerves that runs from the central nervous system to the abdomen, lead to greater vagal tone, to balance the Autonomic nervous system [16] The mind is also calmed by regulating the breath, particularly attending to exhalation and the natural stopping of the breath.

Pranayama and Changes in Respiratory Function

During Pranayama training, regular inspiration and expiration for prolonged period leads the lungs to inflate and deflate at maximal capacity. Subsequently causing strengthening and increased endurance of the respiratory muscles. Pranayama results in improvement in the expiratory power and decreases the resistance to the air flow in the lungs. Shankarappa, et al. [17] reported that among 50 adults who underwent Pranayama training, that there was a statistically significant increase in pulmonary function. Abel, et al. demonstrated an improvement in pulmonary function within a minimum of 10 weeks from regular yoga. Studies evaluating the effect of yoga and pranayama among patients with chronic lung disease have indicated that these methods resulted in decreased dyspnea, increased exercise capacity and improved oxygenation. The mechanisms behind the improvement are manifold and include the positive effect of low, relaxed breathing in a longer time for expiration and relieves gas trapping. Sectional and rapid abdominal breathing or Kapalabhati Pranayama, increases the resistance of the respiratory tract [18-20].

Pranayama Techinques

A proper understanding of the technique is essential to acquire the positive effects of Pranayama.

Pranayama itself is a complete practice and needs to be included in every asana for its completion [21,22]

Padmasana

To start the Pranayama, one should be seated comfortably using the Padmasana or lotus pose (Figure 1) or Ardha Padmasana (Figure 2). To start, sit of the floor and stretch your legs straight. Hold the right leg in both hands and fold the right leg and place it in the left thigh. Repeat the same on the left leg and place the feet on the right. Keep your back straight and chin parallel to the ground.

Figure 1: Padmasana.

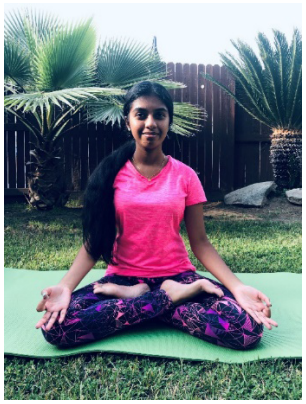

Figure 2: Ardha Padmasana.

Nadhi Sodhana or Anuloma Viloma

Nadhi sodhana, is also known as alternative nostril breathing, is used to help calm the nervous system, can also purify the blood, calm the mind, reduce stress, and promote concentration.

Nadhi sodhana can be done seated in the Padmasana pose. To start, empty all the air from your lungs. Use your thumb to fold your index and middle finger to create the Vishnu Mudra (Figure 3). Using the thumb, block your right nostril and inhale through your left nostril only. Be sure to inhale into your belly, not your chest. Once you are full of breath, seal your left nostril with the ring finger of the same hand, keeping your right nostril closed, and hold the breath for a moment. Then release your thumb and exhale through your right nostril only. Be sure to exhale all the breath out of the right side and pause before inhaling again through the same side. Seal both nostrils once you've inhaled on the right side and exhaled through the left side. A complete cycle of breath includes an inhalation and exhalation through both nostrils. Perform up to ten cycles (Figure 4).

Figure 3: Vishnu Mudra.

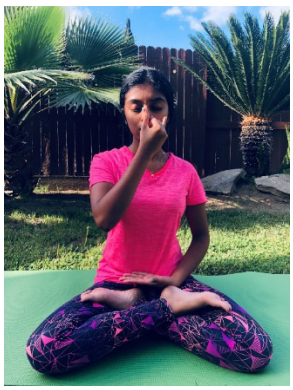

Figure 4a: Anuloma Viloma.

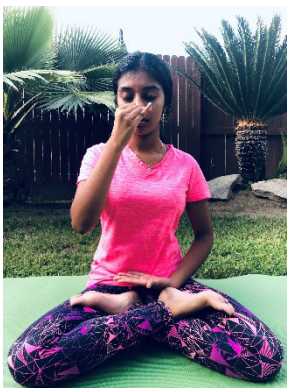

Figure 4b: Anuloma Viloma.

Kapalabhati Pranayama

Kapalabhati means skull shining breath. The Kapalabhati technique is used to clear mucus in the air passages, relieve congestion, reduce bloating, and improve lung capacity. Start by sitting in a Padmasana pose, and exhale completely. Inhale briefly

through both nostrils, then sharply exhale (again out of your nose) while pulling your navel in toward your spine. The exhalation is short and quick, but very active, while the inhalation is short and passive. Again, pull your navel in as you exhale and soften it on the inhalation. Do one round of 30 (counting your exhalations) and rest for a minute with some deep breaths in between and repeat. Start with 15 cycles and then increase as tolerated.

Ujjayi Pranayama

Ujjayi means victorious breath. Ujjayi encourages full expansion of the lungs, and, by focusing your attention on your breath, it can assist in calming the mind.

Take a steady breath in through both nostrils. Inhale until you reach your lung capacity; maintain a tall spine. Hold your breath for a second, then constrict some of the breath at the back of your throat, as if you were about to whisper a secret, and exhale slowly through both nostrils. This exhalation will sound like an ocean wave or gentle rush of air. You should feel the air on the roof of your mouth as you exhale. Repeat up to 20 times.

Sitali Pranayama

Sitali means cooling, which explains the effect it can have on your mind and body. This breath encourages clearing heat with coolness.

Roll your tongue until the outer edges touch, forming a tube. If you can't curl your tongue, make an oval shape with your mouth, keeping your tongue flat. Inhale through your mouth, taking in all the air that you can. It may make a hissing sound. After inhaling, bring the tip of your tongue to the roof of your mouth and seal your lips. Feel the coolness of the inhalation in your month then exhale through your nose. Repeat up to 10 times.

Conclusions

The practice of Pranayama as therapeutic tool during the COVID-19 pandemic may help ensure better physical and mental health among the public. Proper training of pranayama by a skilled teacher and a 30-minute practice every day will maximize the benefits of this ancient health ritual. Health care providers play a crucial role in encouraging patients to maintain performing yoga during this challenging time.

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