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Review Article

Rationale of *Anulom Vilom*, the Practice of Alternate Nostril Breathing

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Abstract

Anulom-Vilom (AV) is a very simple breathing drill (pranayam) that has been practiced in India for thousands of years. Besides being easy, it also requires very little energy. It is perhaps because of its very simplicity that it has been given little importance in past studies on pranayam, a system of numerous Yogic breathing exercises. In recent years, the physiological effects of practicing AV have been studied in great detail. The beneficial effects range from stabilization of the heart rate, improved pulmonary function, decrease in anxiety levels and better digestion to increased cognition and mental concentration. These improvements are attributed to the enhancement of parasympathetic activity through the slow, regulated breathing patterns characteristic of AV pranayama.

Additionally, AV, also known as Alternate Nostril Breathing (ANB), enhances the functionality of alveoli, the small air sacs within the lungs, by promoting the release of surfactants which lower surface tension in the alveoli, thereby allowing the alveoli to expand fully. This results in increased vital capacity and breath holding times. In addition, the power of the muscles participating in breathing, namely the intercostal muscles and diaphragm, is also increased by AV. All these improvements in cardio-respiratory function and central nervous system activity result in increased energy levels and an enhanced feeling of well being.

Keywords: Alternate Nostril Breathing (ANB); Anulom Vilom; Pranayam

1. Introduction

The performance of Alternate Nostril Breathing (ANB) exercise, known as Anulom Vilom in India, for just five minutes a day, can yield immense benefits, regardless of age, gender or physical status. AV is characterized by slow and controlled breathing through alternate nostrils. Numerous studies have examined the beneficial impact of Anuloma-Viloma (AV) pranayama or Alternate Nostril Breathing (ANB) across various age groups. These studies have demonstrated that AV practice can enhance respiratory function, improve microcirculation in the cardiac muscles, reduce anxiety and improve brain functioning.

Telles., *et al*. in 2019, and Jahan., *et al*. in 2021 conducted human trials and demonstrated improved lung function following AV practice. They postulated this improvement of pulmonary function to result from the increased release of lung surfactant, which aids in better expansion of the alveoli in the lungs, promoting the efficiency of gas exchange, thus facilitating increased uptake of oxygen and better expulsion of carbon dioxide [1,2]. In a study conducted by Chandla., *et al*. (2013), the researchers found significant improvements in heart rate variability, cognition, anxiety, and general well-being among medical students who practiced AV and Bhastrika pranayama [3]. These benefits result from the training of respiratory muscles and modulation of the autonomic nervous system (ANS). The autonomic nervous system is intimately linked to the hormonal system, and the two work in concordance to exert control over the normal physiological processes like metabolism, respiration, cardiac function, digestion and excretion. These are

all involuntary physiological processes, over which the conscious brain has the capacity to exert only minimal control. Practices involving specific nostril breathing are known to selectively activate these autonomic components, thereby aiding in stress relief and benefiting cardiovascular function.

2. The autonomic nervous system

The brain and spinal cord together constitute the Central Nervous System (CNS). The conscious brain executes its voluntary actions through the spinal cord, carrying out everyday functions such as locomotion, feeding, shaving, combing hair, driving etc. The autonomic nervous system (ANS), on the other hand, carries out body functions that we are not even conscious about, such as digestion, breathing, sweating, blood circulation etc. The ANS has two components, the sympathetic and parasympathetic nervous systems, which have opposing functions. Though centered in the brain, the nerve signals of the ANS are largely not carried via the spinal cord, rather through separate nerve bundles, running directly between the brain stem and the various body systems and organs. While the sympathetic impulses are carried via the Sympathetic chain running parallel to the vertebral column on the posterior wall of the torso, the parasympathetic system exerts its actions mainly through the Cranial nerves, primarily the Vagus nerve.

The sympathetic and parasympathetic nervous systems usually cause antagonistic actions on the organs and body systems. For instance, sympathetic stimulation causes the pupils to dilate, while parasympathetic activity causes pupillary constriction. Similarly, stimulation of the sympathetic nervous system (SNS) causes an increase in heart rate and blood pressure, while stimulation of the parasympathetic system results in decreased heart rate and blood pressure. The blood pressure is a function of the extent of contraction of the smooth muscles in the walls of the arteries (which determines vaso-dilation or vaso-constriction, changing the caliber of the vessels), alongwith the strength of the pumping action of the heart. Hence, vasodilation, which increases the caliber of the arteries, results in lowering of blood pressure by decreasing peripheral resistance to blood flow. Both the rate and strength of the heart pumping, as well as the arterial tone are under autonomic control.

In addition, the parasympathetic nervous system (PNS) controls the muscle tone and contraction of the muscles in the walls of the intestines, almost exclusively. This control is exerted by the Vagus nerve, stimulation of which results in contraction of the intestines, called peristalsis. Secretion of acid in the stomach is also under Vagal control. The PNS and SNS together, also influence the hormonal homeostasis of the body, by interacting with key hormone producing organs, such as the Adrenal glands, Thyroid and Gonads.

3. Association between slow breathing and relaxation

The slow breathing rate associated with ANB promotes relaxation and pacing of the heart, stabilizing the heart rate. Slow breathing is now recognized the world over as the most practical technique of relaxation [5]. According to yogic thought, the physical and emotional state of a person is highly interconnected. Emotional stresses such as anxiety, worry and anger increase the breathing rate and heart rate involuntarily. Stress stimulates the sympathetic nervous system, centered in the hypothalamus, and this increases systemic vascular resistance and the cardiac workload. Long-term stress is associated with an increased incidence of cardiovascular diseases, decreased immunity, and worsening of metabolic and other chronic diseases. Voluntary breathing control (breathwork) helps break down the vicious stress-mediated cycles of negative physiological effects via generalized relaxation. There is a reduction in baseline cortisol levels during breathing exercises, indicating decreased sympathetic activity. However, while practicing breathwork, an acute challenge increases the blood glucocorticoid levels (cortisol) significantly, suggesting that while the baseline stress level is reduced, the ability to fight against stressful stimulation is improved significantly [6].

4. The steps in the practice of Alternate Nostril Breathing (ANB) or Anulom Vilom

This simple breathing exercise begins by first closing the right nostril with a finger. Breath is taken in from the left nostril, and held for a few seconds, as much is comfortable. Meanwhile, the finger closing the right nostril is removed, and the left nostril is blocked using a finger by pressing the ala against the nasal septum. Air is then slowly exhaled from the right nostril. After complete exhalation, air is now inhaled from the right nostril (left nostril

continues to be closed using finger). The breath is again held for few seconds, finger is shifted to close right nostril, and air is exhaled from left nostril (Figure 1). The cycle is then repeated.

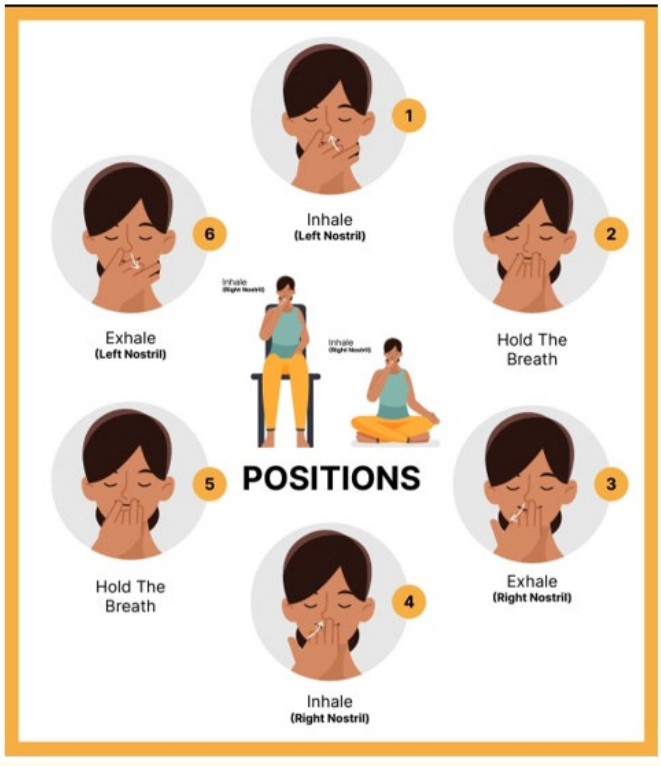

Figure 1: Steps of doing Anulom Vilom (Nadi Shodhan). The exercise is performed while sitting, either cross legged on the floor, or on a chair with the back held straight.

In case holding the breath feels uncomfortable, or is not possible because of co-existing medical problems, the procedure may be carried out without holding the breath (Figure 2). When the breath is held, the ANB process is known as Nadi Shodhana (Figure 1). In either case, the breathing is carried out gently and slowly during the AV process. The exercise may be carried out in a fragrant environment for even more enhanced effects [4]. A fragrant ambience may be achieved either by lighting incense sticks (agarbattis), using electric aroma vaporizers or by sprinkling perfume (Ittar) on the clothes or around the neck region.

5. The normal nasal cycle and its association with the lateralizing circadian cycles of autonomic activity

It is often not noticed that at any given time, we inspire and expire only through one nostril. This continues for a few hours, before

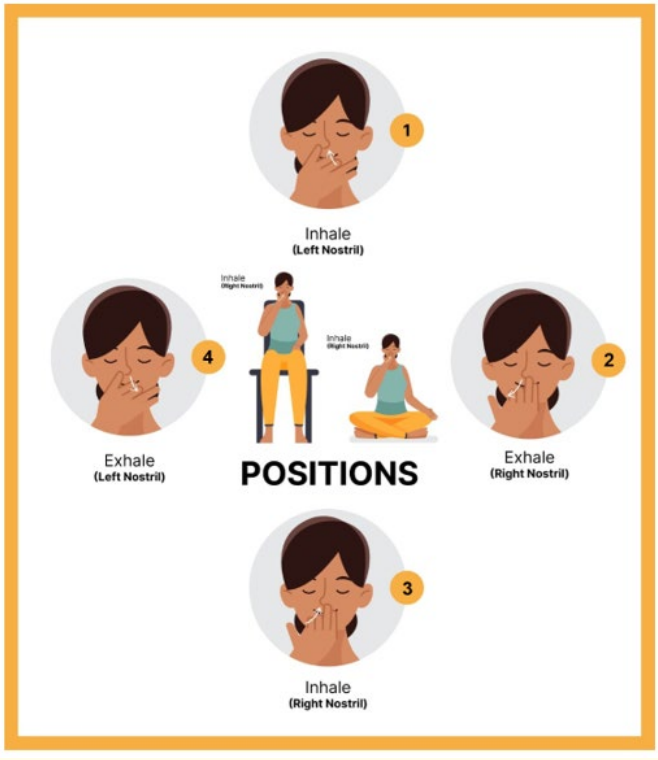

Figure 2: Anulom Vilom may be performed in just four steps, omitting the breath holding ones.

air flow ceases in the current nostril, and the other nostril starts functioning. Thus, there is an alternating pattern between right and left nostril dominance, arising due to the level of nostril congestion. These alternating phases of congestion and decongestion of nasal tissue are based on predominance of parasympathetic or sympathetic tone [7]. This alternating breathing from one nostril at a time, generally spans 2-3 hours at one stretch, although it varies with each individual. For example, the left nostril is in use for inspiration and expiration for 2 hours, then the right nostril takes over, while the air movement through the left nostril ceases. This cycle repeats several times over the course of the day, and is associated with the basic rest - activity cycle (BRAC), in which the sympathetic system is dominant during the active phase ("fight or flight") while the parasympathetic system prevails during the rest phase and during digestion.

Khalsa., *et al*. proposed in 2001 the BRAC is associated with the nasal cycle, and that there is a close relationship with lateralization of autonomic activity and the diurnal rhythms [8]. The circadian

timing system is proposed to be an evolutionary step that developed in order to synchronize physiological activities to conserve energy and optimize functioning. It is also hypothesized that lateralization of ANS activity reflects lateralized variation in dopamine activity in the two cerebral hemispheres [9]. The circadian rhythm system is orchestrated the central pacemaker located in the suprachiasmatic nucleus. This master pacemaker harmonizes the rhythmicity of endogenous, or autonomous clocks functioning in different central and peripheral tissues. These peripheral ultradian clocks autoregulate through transcriptional and translational feedback loops.

As given above, the phenomenon of the nasal cycle is due to alternating congestion and decongestion of opposite nostrils. The nasal mucosa is densely innervated with autonomic fibers and the dominance of sympathetic activity on one side produces vasoconstriction in the turbinates causing decongestion, while in the contralateral nostril, there is a simultaneous dominance of parasympathetic activity that induces swelling of the mucosa, causing congestion. It is contended that forced right nostril breathing increases the general sympathetic tone, while left nostril breathing increases a more "parasympathetic state" which coincides with the "resting phase" of the BRAC. So, regular ANB practice can disrupt the BRAC responses by drawing new balance states between the respiratory, cardiovascular and autonomic nervous systems [10]. Also, it has been observed that beneficial effects of alternate nostril breathing manifest sooner, and are more prominent in subjects with prior yogic experience, implying that regular practice of alternate nostril breathing has positive outcomes.

6. PHYSIOLOGICAL STUDIES CONDUCTED TO ASSESS THE EFFECTS OF PRACTICING ANULOM VILOM

6.1 Effects of AV on Brain function

Bamne (2017) reported a significant decrease in both auditory and visual reaction times immediately following AV pranayama practice, indicating enhanced sensory-motor performance and accelerated information processing by the central nervous system (CNS) [11]. Dhadse and Fadia (2013) also documented a significant reduction in visual reaction times among individuals post-Anulom Vilom pranayama intervention, compared to a control group [12]. This enhancement is likely due to increased arousal and an improved ability to focus and filter out irrelevant stimuli. The workers concluded that the underlying mechanisms may involve alterations in thalamocortical processing, as suggested by Telles., *et al*. enhancing the brain's ability to integrate and respond to sensory information more effectively [2]. AV pranayama also influences autonomic nervous system (ANS) outputs, modulating the balance between sympathetic and parasympathetic activities. In fact, AV causes a shift towards parasympathetic dominance, which results in mental relaxation and improves cognitive functions, including memory recall and learning abilities [2,13,14].

Furthermore, a study exploring Right Nostril Breathing (RNB), Left Nostril Breathing (LNB), and Alternate Nostril Breathing (ANB) has documented the activation of specific brain hemispheres and their associated cognitive functions [15]. The findings suggest that RNB may stimulate the left hemisphere, which is responsible for logical reasoning, numerical ability, and analytical processing. This stimulation potentially enhances memory recall for tasks such as Digit Span Forward (DSF) and Digit Span Backward (DSB), which require the retrieval and processing of numerical data. Additionally, LNB is believed to target the right hemisphere, associated with creativity and spatial awareness, which may help in balancing and restoring memory functions typically managed by the left hemisphere [13-15]. The beneficial effects of AV effects on Neurogenesis (brain regeneration) are described later in this article.

6.2 Effects of AV on Lung function

Pramanik., *et al*. (2018) suggested that AV training could enhance respiratory muscle function, thereby improving breathing rates [16]. The study proposed that AV pranayama might also improve microcirculation in cardiac muscles, resulting in enhanced cardiovascular functions, reflected in parameters such as resting pulse rate. The bettered microcirculation also could be responsible for the increase in the breath-holding time and vital capacity of the subjects. Additionally, by enhancing the strength of respiratory muscles, particularly the diaphragm and intercostal muscles, AV enhances lung capacity and efficiency. This enhancement is evidenced by increased measurements of Forced Vital Capacity (FVC) and Forced Expiratory Volume (FEV) in the first second of forced expiration (FEV1), indicating improved pulmonary function [1,17].

A few research studies have shown that Anulom Vilom and Bhastrika pranayama contribute to enhanced VO2max (maximal

oxygen consumption), among healthy individuals, suggesting significant improvements in lung function. According to Shirodkar., *et al*. (2019), this enhancement can be attributed to various physiological mechanisms, including the release of lung surfactants and prostaglandins that increase lung compliance and reduce bronchial muscle tone [18]. By enhancing the functionality of alveoli through promotion of the release of surfactants which lower surface tension in the alveoli, AV improves the efficiency of gas exchange. This improvement in gas exchange facilitates increased oxygen uptake and carbon dioxide expulsion [1,2]. The enhanced lung capacity and more efficient oxygen exchange contribute to improved aerobic capacity and endurance, as reflected by increased Peak Expiratory Flow Rate (PEFR) values [1,15]. This enhancement is particularly advantageous for athletes and individuals engaged in physical activities. The augmentation in pulmonary function can also be attributed to improved clearing of nasal passages, more effective utilization of diaphragmatic and abdominal muscles, and a calming effect on the mind which may reduce stress-induced bronchoconstriction.

6.3 Psychological benefits of AV

ANB has been demonstrated to influence brain regions involved in emotional regulation, including the amygdala, hippocampus, and prefrontal cortex. This is because the olfactory nerves, supplying the nasal passages, are connected to the limbic system via the olfactory tract. The action of performing AV not only calms the neurons in the brain, but also affects feelings, which are closely linked to the limbic system. This system is responsible for transforming sensory perceptions into emotional responses. By modulating neural activity in these key areas, ANB can bolster emotional resilience and diminish the psychological impact of stress [19]. Additionally, ANB can stimulate the release of hormones such as oxytocin and prolactin, which play roles in enhancing well-being, supporting bonding, and facilitating relaxation. These hormonal effects may be particularly advantageous for individuals experiencing emotional trauma and stress, including survivors of intimate partner violence [19].

Another study suggested that the alternating airflow through the two nostrils in quick succession might activate mechanical receptors within the nasal mucosa, which then send signals to the hypothalamus—a critical center for autonomic regulation. This activation could indirectly influence memory and cognitive functions through alterations in cerebral blood flow or changes in the brain's energy metabolism [15]. Regular practice of Anulom Vilom pranayama not only assists in managing stress by reducing sympathetic nerve activity but also boosts parasympathetic tone, leading to a more relaxed and focused mental state conducive to faster and more accurate sensory responses [12].

6.4 Beneficial Effects of AV on the Heart, blood circulation and stress

Uikey., *et al*. documented a significant reduction in systolic blood pressure, diastolic blood pressure, and heart rate among hypertensive patients after four weeks of consistent Anulom Vilom (AV) pranayama practice [20]. This beneficial effect of form AV is proposed to result from its ability to modulate the ANS, promoting a balance between the sympathetic and parasympathetic systems. Regular practice of the technique enhances pulmonary stretch receptor activity, which inhibits sympathetic tone and promotes vasodilation, subsequently reducing peripheral resistance and lowering blood pressure. This reduction in blood pressure is advantageous for the prevention and management of hypertension and lessens the overall strain on the cardiovascular system [1,14,17]. Regular practice of Anulom Vilom pranayama is also suggested to improve cardiac output and modulate both cerebral and peripheral blood flow, highlighting its potential therapeutic impact on cardiovascular health. By enhancing parasympathetic activity, AV leads to a decrease in heart rate and reduction in blood pressure, while simultaneously reducing sympathetic activity associated with stress responses [1,14,21].

Several studies have highlighted the observation that shift work often increases sympathetic activity due to stress and irregular sleep patterns, leading to elevated blood pressure and increased heart rate. Udaykumar., *et al*. in 2021 conducted a study that showed that AV can reduce the stress in shift workers, providing a calming effect [17]. This stress modulation may further lead to enhanced relaxation and reduced anxiety, thereby creating a more conducive environment for cognitive functions, including memory [14,15]. Interestingly, AV may also increase baroreflex sensitivity, which aids the body in maintaining stable blood pressure levels. Improved baroreceptor sensitivity allows the body to more effectively detect and respond to changes in blood pressure, thereby maintaining homeostasis [1,21].

Moreover, the practice of AV stimulates the vagus nerve, which plays an important role in the responses of the parasympathetic nervous system. Vagal stimulation by ANB increases vagal tone, resulting in a reduction in heart rate and increased gastrointestinal activity [21,22]. Interestingly, the enhanced vagal tone may improve cognitive functions by reducing stress and enhancing focus. Breathing practices involving prolonged exhalation, such as AV, have been shown to be particularly effective in increasing vagal tone [2,13]. Stimulating the vagus nerve by AV can also influence the hypothalamic–pituitary–adrenal hormonal axis, which regulates the release of stress hormones, notably cortisol. Through regular practice, ANB can reduce cortisol levels, thereby diminishing the overall stress burden on the body [19].

Researchers have also reported that AV impacts Heart Rate Variability (HRV), specifically by increasing the "Expiration : Inspiration" ratio [21]. This ratio is an important measure of the balance between parasympathetic and sympathetic nervous system activities. During AV, deeper and prolonged expiration enhances the parasympathetic response, which reduces heart rate variability during expiratory phases [14,17,21]. Additionally, AV improves Respiratory Sinus Arrhythmia (RSA), the natural fluctuation in heart rate that occurs with inhalation and decreases during exhalation, serving as a direct marker of parasympathetic activity. By alternating nostril usage, ANB enhances this effect, exerting a calming influence on the cardiovascular system [21]. This respiratory-cardiac synchrony enhances oxygen uptake efficiency and reduces cardiovascular strain, which can decrease both blood pressure and heart rate. The increased parasympathetic activity promotes a state conducive to better stress management and recovery [19].

6.5 Benefits of alternate nostril breathing on olfaction and neurogenesis

The practice of Anulom Vilom may be advantageous to the function of olfaction, which is unique among the sensory functions of the body. This uniqueness stems from the fact that unlike other sensory neurons performing disparate functions, such as vision and taste, the olfactory sensory neurons act directly as odor sensors, without any special receptors. In the eyes and tongue, there are specific receptors that receive the light and taste signals, and convey these signals to neurons, which then transport the signals to the brain. In other words, there are no separate odor receptors in the nose, rather the olfactory neurons themselves function as receptors. On picking up the odor, the olfactory neurons convey the odor information directly to the olfactory bulb in the brain, after passing through the perforations in the cribriform plate located at the roof of the nasal cavity. Another unique and highly useful characteristic of the olfactory neurons located in the nasal epithelium is their continuing ability to divide throughout life, a process known as neurogenesis.

In an elegant experiment, Hsu., *et al*. in 2024 studied the deleterious effects of long-term unilateral nasal blockage in rats [23]. They found that this resulted in significantly reduced MMP-3 in the nasal region of the experimental group of rats. MMP-3 (matrix metalloproteinase-3) is mainly expressed in the respiratory epithelium, and has been reported to participate in cell proliferation in the naso-epithelial cell line [23]. The reduction of the MMP-3 signal would result in decreased regeneration of new olfactory neurons in the nasal epithelium (decreased neurogenesis). Thus, there would be decreased replacement of worn-out olfactory neurons, resulting in diminished olfactory perception and discrimination. A diminution of olfactory function is already known to be associated with some neuro degenerative conditions, and this decreased sense of smell could affect several other emotional functions modulated by the olfactory pathway.

Anulom Vilom has been shown to have positive effects in restoring the olfactory dysfunction in COVID-19 patients. Olfactory dysfunction was a prevalent symptom among patients recovering from COVID, and developed without significant inflammation or swelling of the nasal mucosa. The study by Nikolenko., *et al*., showed that performing ANB exercises significantly alleviated olfactory dysfunction in the patient group [24]. This study further demonstrated that the AV pranayama technique was particularly effective in individuals under the age of 40 and that the duration of olfactory dysfunction impacted the effectiveness of the restoration. They suggested that the possible physiological mechanisms aiding in restoration of olfactory dysfunction, might be by enhancing blood oxygenation, improving metabolism, reinforcement of the microcirculation, and augmented regeneration (neurogenesis) of olfactory epithelial cells.

Additionally, Kanorewala., *et al*., in his review, has articulated the view that ANB has a significant impact on olfaction by directing

airflow towards the brain and specifically stimulating the smell centers, which then stimulate the olfactory nerves. Additionally, the airflow affects the mucous membranes in the nose, which can be congested due to colds, infections, or sinus blockages [25]. Nasal breathing exercises in general have been demonstrated to improve airway patency and reduce mucosal thickness that facilitate nasal airflow and odorant transport to olfactory receptors [25]. Furthermore, regular exercise can reduce inflammation in the nasal passages and olfactory mucosa, a common issue in chronic sinusitis that contributes to olfactory dysfunction [26]. This reduction in inflammation may help restore normal olfactory function by clearing obstructions in the olfactory pathway.

7. Discussion

It is well known that our mental and emotional states affect our breathing pattern [27]. The reverse process, that is, altering our breathing pattern, can also directly have an impact on our emotions and feelings. Directing airflow to each nostril alternately in succession for a few minutes, in contravention to the normal nasal cycle, can help achieve a balance in emotions and feelings which further affects the breathing pattern, resulting in a better neuro-hormonal equilibrium The overall remediation of the neuro-endocrinal axis results in reduced stress, enhanced neurogenesis and better olfaction. The facial muscles, especially those of the lips and eyebrows, which express the emotional states such as joy, anger, fear, and anxiety, are also affected by the breathing pattern, and practices such as AV can improve facial expressions by reducing anxiety, anger and fear. These effects of ANB are attributable to the enhanced functioning of the parasympathetic nervous system.

Specific nasal breathing techniques such as AV also help to modulate cerebral blood flow through altered breathing patterns, influencing brain activity and cognitive functions. Enhanced oxygenation during controlled breathing could improve neuronal firing efficiency and synchronization across various brain regions involved in memory processes [15]. Additionally, ANB may enhance the coordination between the cortical and subcortical regions, particularly the interaction between the frontal cortex and the limbic system, through rhythmic and focused breathing practices. This enhanced coordination might improve the efficiency of memory encoding and retrieval processes [1]. Furthermore, the practice of ANB may induce changes in EEG patterns, reflecting alterations in brain dynamics that enhance cognitive functions and sensory processing. This includes potential modifications in event-related potentials (ERPs) such as the P300, which is associated with the cognitive process of updating an individual's assessment of their environment. This ERP component is crucial for tasks involving attention and discrimination [2].

Additional research has indicated that chronic stress, such as that experienced by survivors of intimate partner violence (IPV), often results in dominant action of the sympathetic nervous system (SNS) in the victim's physiology This dominance is characterized by increased heart rate and blood pressure, and elevated levels of stress hormones. ANB helps counteract these effects by enhancing the activity of the parasympathetic nervous system, which promotes relaxation and reduces physiological markers of stress [19]. ANB may also augment the levels of gamma amino-butyric acid (GABA) in the hippocampus. GABA is an inhibitory neurotransmitter in the brain that facilitates relaxation, most likely mediated through increased stimulation of the vagal nerve. The enhanced GABAergic activity thus contributes to reductions in anxiety and stress [19]. Furthermore, ANB requires focused attention on breathing and the alternate use of nostrils, which can divert attention from stressful thoughts and induce a meditative state. This shift in focus can help alter psychological and emotional responses from stress and anxiety to calmness and mindfulness, providing significant mental health benefits, especially for individuals dealing with chronic stress [19].

Since AV exerts a great impact on olfactory function, it stands to reason that the emotional and behavioral functions affected by olfaction will also be impacted. The olfactory tract and olfactory cortex project to several parts of the limbic system, including the basal ganglia [28]. These important structures in the limbic system and basal ganglia include the amygdala, hippocampus, thalamus, hypothalamus, cingulate gyrus and corpus striatum [29]. The limbic system is involved in the processing of long term memories, especially smell linked memory associations, and also emotions, behavior and motivation, along with housing the reward and pleasure center in the brain [30]. Hence, AV can play a useful role in stabilizing the mood and boosting memory recall.

8. Conclusion

Anulom-viloma Pranayama or ANB is a commonly practiced yogic breathing techniques and involves breathing alternately

through each nostril while closing the other nostril manually. The normal nasal cycle consists of alternating phases of congestion and decongestion of nasal mucosa, ranging from 2-3 hours, allowing air flow to occur through only one nostril at a time for several hours at a stretch. The physiological control of the nasal cycle is the based on the predominance of parasympathetic or sympathetic tone. Breathing alternately through each nostril in quick succession helps to restore balance between the two components of the autonomic nervous system. Potential benefits of regular practice of ANB include modulation of sympatho-vagal balance, improved cardiac and pulmonary function, stronger metabolism, relief of stress and delayed normal aging processes, among others. There is also improvement in cognitive health, as well as enhanced motor, visual and spatial memory. No studies have reported adverse effects or intolerance of this breathing technique. ANB is easy to learn, free of cost and does not require any equipment or major time investment.

9. Conflict of Interest

There is no conflict of interest.

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