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Role of pranayama and exercises on ocular health

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Abstract

Eyes are among the most crucial and sensitive organs, needing a constant supply of oxygen and nutrients for their optimal functioning. Lately, factors like increased screen usage, sedentary lifestyles, and stress have led to a rise in eye disorders, including dry eye syndrome, digital eye strain, glaucoma, and age-related macular degeneration. New findings indicate that age-old practices such as *Pranayama* (yogic breathing) and regular exercise can significantly contribute to the maintenance and enhancement of eye health. *Pranayama* improves oxygen delivery to the body and diminishes oxidative stress by influencing the autonomic nervous system, which leads to better blood flow to the eyes and lower intraocular pressure. Practices such as *Anulom Vilom*, *Bhramari*, and *Nadi Shodhana*, *Tratak* are recognized for their ability to induce relaxation, enhance retinal circulation, and assist in managing issues like glaucoma and diabetic retinopathy. Likewise, engaging in physical exercise boosts cardiovascular performance, improves blood flow including that to the eyes and helps in managing systemic risk factors such as Diabetes and Hypertension, which significantly contribute to eye-related health issues. The use of *Pranayama* and physical exercise as complementary approaches to foster eye health, avert vision impairment, and improve overall visual performance. Incorporating these holistic techniques into daily habits provides a non-invasive, affordable method to promote eye wellness for both healthy individuals and those susceptible to eye conditions.

Keywords: Pranayama, Tratak, exercises, eye conditions, degeneration, ocular health

Introduction

Need of study

- The prevalence of ocular conditions such as Dry Eye, Refractive errors, Glaucoma, Hypertensive and Diabetic Retinopathies etc. is steadily increasing due to poor dietary practices, increased use of visual display terminals (VTDs), disturbed sleep patterns, substance addiction, and heightened workplace stress.
- Treatments available so far are having their own limitations and side effects on long term use.

Hence there is a growing need to explore safe, natural, and cost-effective approaches like *Pranayama*, Ocular and physical exercises, which have the potential to enhance ocular health.

Methods

Ayurvedic classical texts, Modern literatures, Journals and Articles were collected & studied for role of *Pranayama* and Exercise on ocular diseases.

Aims an Objective

To access the impact of *pranayama* and exercise on ocular health.

Pranayama

The word *Pranayama* is derived from two *Sanskrit* words, *Prana* and *Ayama*. *Prana* means life force or vital energy, the power that sustains all living beings. Without this vital energy, life is impossible. From the very moment of birth, the process of inhalation and exhalation begins and continues until the end of life.

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Ayama means expansion, regulation, or control. When the natural process of breathing is consciously regulated, refined, and practiced systematically, it is called *Pranayama*. It is not merely the act of inhaling and exhaling, rather it is the science of balancing and channelizing the vital life energy within us [1].

The practice of *Pranayama* regulated, conscious breathing exercises from *Yoga* has been traditionally understood to harmonize life force (*prana*) and calm the mind. Modern research is increasingly exploring its effects on specific eye-health parameters, especially intraocular pressure, ocular strain, blood flow, and stress-related ocular changes.

Anulom-Vilom [2] (Alternate Nostril Breathing)

It is one of the most beneficial and widely practiced breathing techniques in yoga. Anulom means in a natural order (inhale). Vilom means reverse order (exhale). It involves breathing alternately through each nostril, which balances the flow of *prana* (vital energy) in the body.

- Sit in a comfortable meditative posture (Padmasana, Sukhasana, or Vajrasana) with spine erect.
- Place the left hand on the knee in Gyan Mudra.
- With the right hand, use the thumb to close the right nostril.
- Inhale slowly and deeply through the left nostril.
- Now close the left nostril with the ring finger, release the right nostril, and exhale completely.
- Inhale slowly through the right nostril.
- Again, close the right nostril, open the left, and exhale completely.

Bhramari [3] (Humming Bee Breath)

Deep inhalation followed by slow exhalation while producing a humming sound, resembling a bee.

- Sit in Padmāsana, Sukhasana, or Vajrasana with eyes closed.
- Place both index fingers on the external opening of the ears, lightly closing them.
- Inhale deeply through the nose.
- While exhaling, produce a gentle humming sound like a bee.
- Repeat 5–10 rounds.

Kapalbhati [4] (Cleansing Breath)

Forceful, rhythmic exhalations using abdominal muscles, with passive inhalation.

1. Sit comfortably with spine erect.

- Inhale normally, then perform forceful exhalations through the nose while pulling the abdomen inward.
- Inhalation happens passively, without effort.
- Begin with 20–30 strokes per round and gradually increase.

Trataka [5] (Yogic Gazing Practice)

Trataka is the practice in which a practitioner focuses both the eyes and the mind on a single object. The term *Trataka* is not derived from the number three, as the prefix “tri” might suggest; rather, it signifies continuity and sustained attention.

- When an object is glanced at briefly, it is called *Ekatak* (single gaze).
- When an object is observed for a short duration, it is called *Dwatak* (double gaze).
- When an object is observed continuously for a prolonged period without blinking, it is termed *Trataka*.

Types of Trataka

- **Antah Trataka (Internal Gazing):** Closing the eyes and focusing on the point between the eyebrows or the area around the navel.
- **Madhya Trataka (Intermediate Gazing):** Gazing at a small object made of metal or stone, or the tip of the nose.
- **Bahya Trataka (External Gazing):** Observing external objects such as the moon, stars, or sunlight.

Preparatory Exercises (Pre-Trataka Practices)

- Before performing *Trataka*, it is important to exercise the eyes for 5-10 minutes.
- This includes
- Moving the eyes up and down, left and right
- Rotating the eyes clockwise and anti-clockwise
- These exercises help relax and prepare the ocular muscles, making the *Trataka* practice more effective.

Trataka is a cleansing and concentration practice (*shatkarma* as well as a meditation technique) in which the eyes are steadily focused on a single point or object, commonly a candle flame, dot on the wall, or sacred symbol, without blinking, until tears start flowing. It is followed by closing the eyes and mentally visualizing the same image.

Ocular & Physical Exercise

Ocular exercises and physical activity play a significant role in supporting eye function, preventing strain, and promoting overall visual well-being.

Ocular Exercise [6]

Palming

Palming involves gently covering the closed eyes with the cupped palms to exclude light and promote relaxation. The posture should be comfortable, with elbows supported and shoulders relaxed. Sessions may last from a few breaths to several minutes.

Blinking and Dodging-

Bates emphasized avoiding prolonged staring, which lowers vision and increases ocular stress. Dodging refers to shifting the gaze frequently, whether vision is clear or blurred. Natural blinking is considered a form of dodging, as it interrupts continuous fixation and provides momentary rest. Central fixation, palming, swinging, and blinking all operate on this principle.

Sunning

Sunning is the practice of exposing closed eyes to natural sunlight. With eyes shut, the face is turned gently side to side while breathing slowly, allowing warmth and light to penetrate through the eyelids. Research supports that outdoor light reduces the risk of myopia and helps condition the retina against stress. Alternating sunning with palming (e.g., 20 breaths of sunning followed by 10 breaths of palming) enhances relaxation. Direct staring at the sun should be avoided, and safety precautions must be followed.

Physical Exercise [7]

Physical exercises such as walking, jogging, and aerobic activities positively influence ocular physiology by improving systemic circulation and lowering intraocular pressure. Research suggests that aerobic exercise significantly reduces IOP in both healthy individuals and glaucoma patients, thus

serving as a preventive and therapeutic measure.

Discussion

Many research studies have shown that regular use of *Pranayama*, *Trataka* kriya and Ocular & Physical Exercises play a major role in relieving signs and symptoms of ocular disorders. Probable action of *Pranayama* & exercises as following.

Anuloma-Viloma promotes autonomic balance, reducing sympathetic overactivity and stress, which can lower intraocular pressure (IOP). Enhances oxygenation of blood, ensuring better nourishment to the retina and optic nerve. Improves relaxation of extraocular muscles, reducing eye strain from prolonged screen use or near work. Studies show short-term reduction in IOP in both healthy individuals and glaucoma patients after practicing alternate nostril breathing [8].

- **Bhramari:** The gentle vibration created during exhalation enhances parasympathetic activity, leading to relaxation of ocular and periocular muscles. Reduces stress and anxiety, factors known to worsen ocular hypertension and strain. May improve blood circulation in the head and ocular region, indirectly benefiting retinal health. Neurophysiological studies suggest *Bhramari* reduces stress hormones and promotes calmness, which indirectly contributes to ocular well-being [9].
- **Kapalbhati:** Enhances cerebral and ocular blood circulation, which may support nourishment of ocular tissues. Helps in detoxification and maintaining systemic health, which indirectly supports eye health. May reduce sinus congestion and improve venous drainage from the head and eyes [10].

Trataka [11, 12]

- **Strengthens ocular muscles:** Continuous gazing acts as a workout for extraocular muscles, improving coordination and reducing fatigue.
- **Improves concentration and vision:** Regular practice is believed to enhance focusing power and relieve strain caused by prolonged reading or screen use.
- **Relieves eye disorders:** *Yogic* texts describe its usefulness in conditions like myopia (short-sightedness) and hypermetropia (long-sightedness), though modern evidence is still limited.
- **Reduces dryness and fatigue:** The practice stimulates tear secretion, preventing dry eye symptoms.
- **Relaxes the nervous system:** By focusing attention, *Trataka* calms the mind, reduces stress, and indirectly benefits ocular pressure and circulation.

Ocular exercises improve accommodation, strengthen extraocular muscles, and reduce eye strain caused by prolonged near work. Regular practice has been shown to reduce symptoms of eye fatigue and improve visual efficiency.

Dr. William Bates proposed several natural techniques to relieve visual strain and promote ocular health such as Palming reduces eyestrain, calms the mind, and supports central fixation. These methods focus on relaxation, movement, and adaptation of the eyes to light.

Regular physical activity has systemic benefits that positively affect ocular health.

- **Improved Blood Circulation:** Regular cardiovascular exercises enhance blood flow to the retina and optic nerve, supporting nutrient and oxygen delivery.

- **Regulation of Intraocular Pressure (IOP):** Moderate-intensity exercises, such as walking or jogging, can help maintain healthy IOP, reducing the risk of glaucoma.
- **Metabolic and Hormonal Balance:** Physical activity helps manage blood sugar and blood pressure, lowering the risk of diabetic retinopathy and hypertensive eye disorders.
- **Reduction of Oxidative Stress:** Exercise increases antioxidant activity in the body, protecting ocular tissues from free radical damage.
- **Stress Reduction:** Exercise reduces cortisol levels, alleviating stress-related eye strain and improving visual comfort.

Conclusion

Pranayama, *Trataka*, ocular exercises, and physical activity play a vital role in maintaining ocular health. They help reduce eye fatigue, improve circulation, enhance ocular muscle strength, and regulate intraocular pressure. Integrating these holistic practices with conventional ophthalmic care may provide a safe and effective complementary approach for preventing and managing ocular disorders. Bates' relaxation techniques palming, blinking/dodging, and sunning share the principle of avoiding strain by encouraging rest, movement, and natural light adaptation. When practiced regularly and safely, they may help reduce ocular fatigue, improve visual comfort, and support long-term eye health.

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