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Therapeutic and Scientific Evaluation of the Efficacy of Shatkarma in the Management of Modern Lifestyle Disorders

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ABSTRACT

The escalating prevalence of non-communicable diseases (NCDs)—such as metabolic syndrome, psychosomatic stress, gastrointestinal dysregulation, and pulmonary disorders—can be directly correlated with the sedentary dynamics, circadian disruption, and heightened psycho-emotional burden of contemporary urban life. Rooted in classical Hatha Yoga treatises, Shatkarma encompasses six foundational purification methodologies: Dhauti, Basti, Neti, Trataka, Nauli, and Kapalabhati. These techniques are traditionally ascribed with systemic detoxificatory potency, promoting somatic homeostasis, neurophysiological optimization, and cognitive-emotional equilibrium.

The present inquiry provides a multidisciplinary and evidence-informed exploration into the prophylactic and therapeutic efficacy of Shatkarma in addressing modern lifestyle-induced pathophysiological syndromes. Through critical evaluation of classical yogic doctrine integrated with contemporary clinical insights, this study positions Shatkarma as a potential adjunctive intervention within the framework of integrative and preventive medicine. It underscores the relevance of ancient embodied practices in modulating psychoneuroimmunological functions, enhancing systemic resilience, and advancing holistic health outcomes in the 21st century .

Keywords: *Modern Lifestyle Disorders, Shatkarma, Health, Yogic Detoxification*

1. INTRODUCTION

In the unrelenting pursuit of material advancement, modern individuals often marginalize the essential tenets of a balanced and harmonious daily regimen. The increasing dependence on artificial conveniences has, over time, attenuated the body's inherent regulatory and restorative mechanisms. As a result, the global incidence of lifestyle-associated non-communicable diseases (NCDs)—including obesity, type 2 diabetes mellitus, hypertension, ischemic heart disease, chronic psychological stress, and depression—has reached epidemic proportions, posing a significant burden on public health systems worldwide.[1]

The etiopathogenesis of these conditions is intricately linked to erratic dietary habits, disrupted circadian rhythms, physical inactivity, and sustained psycho-emotional distress. Although allopathic biomedical interventions offer expedient symptomatic relief, their long-term application is often associated with adverse effects, including progressive physiological degeneration and iatrogenic complications.[2]

In this context, the ancient yogic system provides a compelling integrative alternative through **Shatkarma**—a compendium of six foundational internal cleansing techniques meticulously codified in classical Hatha Yogic texts such as the *Hatha Yoga Pradipika*, *Gheranda Samhita*, and *Hatharatnavali*. These include **Dhauti** (upper gastrointestinal cleansing), **Basti** (yogic enema), **Neti** (nasal irrigation), **Nauli** (abdominal muscle churning), **Trataka** (visual concentration), and **Kapalabhati** (frontal cranial purification via forceful exhalations).[3]

These purification modalities are not merely hygienic in a somatic sense; they are multidimensional practices aimed at restoring homeostasis across the physiological, neuroendocrine, and psycho-emotional axes. They have been historically acclaimed for their ability to detoxify organ systems, stimulate metabolic fire (*Agni*), balance the *doshas* (Vata, Pitta, Kapha), and stabilize mental fluctuations, thereby offering a systemic framework for integrative health maintenance and disease prevention.[3]

Accordingly, **Shatkarma represents a holistic paradigm of yogic purification**—physical, psychological, and spiritual—positioning itself as a potentially viable and cost-effective modality in both preventive and therapeutic contexts, especially in the mitigation of modern lifestyle-induced morbidities

Shatkriya: Canonical Exegesis in Classical Hatha Yogic Texts

Within the doctrinal corpus of classical Hatha Yoga, four seminal treatises are widely acknowledged for their foundational authority: the *Hatha Yoga Pradipika*, *Gheranda Samhita*, *Shiva Samhita*, and *Hatharatnavali*. Among these, the *Gheranda Samhita* and the *Hatha Yoga Pradipika* offer codified and systematic delineations of the six principal yogic purification techniques, collectively termed as **Shatkriya**. The *Gheranda Samhita* meticulously articulates the classifications, procedural nuances, and psychophysiological as well as therapeutic efficacies of each kriya, underscoring their relevance in both preventive and curative paradigms of health.

Correspondingly, the *Hatha Yoga Pradipika*—in conjunction with the *Hatharatnavali*—elaborates on the multifaceted modalities of yogic detoxification and their integrative effects on somatic vitality, pranic equilibrium, and cognitive clarity. These classical manuscripts constitute the epistemological and soteriological bedrock upon which the architecture of yogic purification rests. They encapsulate a comprehensive theoretical and praxis-oriented schema that continues to inform contemporary interpretations of internal cleansing within both traditional and integrative medical systems.[4]

धौतिर्वस्तिस्तथा नेतिः लौलिकी त्राटकं तथा।

कपालभातिश्चैतानि षट्कर्माणि समाचरेत् ॥12 घे सं [5]

Efficacy of Shatkarma in the Management of Lifestyle Disorders

Dhauti (Yogic Internal Cleansing)

In the classical yogic compendium *Gheranda Samhita*, the term **Dhauti** is linguistically derived from the Sanskrit root "*dhav*," meaning *to wash or cleanse*, and refers to a set of systematic practices aimed at the purification of the internal bodily systems.[5] The text delineates Dhauti into four principal categories:

Antar Dhauti (internal visceral cleansing)

Danta Dhauti (oral and dental hygiene)

Hrida Dhauti (cardiac and upper gastrointestinal tract cleansing)

Mula Shodhana (rectal cleansing)

These traditional techniques are considered integral components of the *Shatkriya* system in *Hatha Yoga*, functioning to maintain physiological homeostasis and optimize digestive, respiratory, and metabolic efficiency.

Contemporary applications of Dhauti have evolved into specialized practices such as **Vamana Dhauti (Kunjal Kriya)**, **Vastra Dhauti**, and **Shankha Prakshalana**, which are now investigated for their therapeutic and detoxificatory potential in both clinical and integrative medicine contexts.

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1.1. Kunjal Kriya (Induced Emesis for Gastric Detoxification)

Kunjal Kriya involves the **volitional induction of emesis** through the consumption of **lukewarm isotonic saline solution**, typically on an empty stomach. This procedure facilitates the mechanical evacuation of gastric contents, effectively cleansing the **stomach mucosa** and neutralizing excess *acidic secretions*. The kriya is noted for its role in managing conditions such as **hyperacidity, indigestion, and psychosomatic gastrointestinal disorders**. Controlled studies have also examined its potential influence on **autonomic regulation and vagal tone enhancement**.

1.2. Vastra Dhauti (Textile-Based Upper GI Cleansing)

Vastra Dhauti comprises the **oral ingestion of a sterile, soft cotton cloth**, typically measuring approximately 7 Yards **in length and 4 centimeters in width**, followed by its gentle extraction after a short retention period. This technique is designed to facilitate **mucosal scraping and decongestion of the esophagus and stomach lining**, thereby eliminating residual toxins (*Ama*) and improving **digestive motility and gastric secretions**. It is often prescribed in traditional systems for conditions

such as **phlegmatic disorders, chronic gastritis**, and **psychosomatic nausea**.

1.3. Shankha Prakshalana (Complete Intestinal Wash Using Yogic Kinetics)

Shankha Prakshalana is one of the most comprehensive and physiologically demanding **intestinal detoxification protocols** in Hatha Yoga. It involves the **cyclical consumption of warm saline water** (typically 400–600 ml at a time), interspersed with a series of **five dynamic yogic asanas**:

Tadasana (Palm Tree Pose)

Tiryaka Tadasana (Swaying Palm Pose)

Kati Chakrasana (Spinal Twist Pose)

Tiryaka Bhujangasana (Twisting Cobra Pose)

Udarakarshanasana (Abdominal Churning Pose)

These postures are performed in a specific sequence to **facilitate peristaltic movement**, encouraging the saline solution to traverse the **entire gastrointestinal tract**, leading to total colonic evacuation. Clinically, it is recognized for its application in the management of **constipation, metabolic sluggishness, skin disorders**, and as a preparatory technique for **fasting or panchakarma therapies**.

1.4.Classical Therapeutic Interpretations of Dhauti in Traditional Yogic Texts

The classical treatises of *Hatha Yoga*, notably those authored by Sage Gheranda, Yogi Swatmarama, and Yogi Srinivasa, provide an elaborate exposition on the therapeutic efficacy of **Dhauti**, conceptualized as an essential yogic kriya for systemic purification and restoration of homeostasis.[56] These ancient authorities emphasize Dhauti as a principal mechanism for the elimination of physiological impurities, the rectification of humoral imbalances (Vata, Pitta, Kapha), and the enhancement of **digestive metabolism (Agni)**.

They assert that the consistent practice of Dhauti facilitates the remission of a diverse range of pathological entities, including but not limited to **cardiometabolic disorders**, **gastrointestinal dysfunctions**, **abdominal neoplasms (Gulma)**, **febrile syndromes (Jwara)**, and **splenic anomalies (Pliha)**. Furthermore, Dhauti is believed to effectuate the cleansing of **Nadis** (subtle energetic conduits), thereby augmenting **somatic vitality**, **neurocognitive lucidity**, and **spiritual receptivity**.[6]

From a psychosomatic standpoint, regular practice of Dhauti has been implicated in the mitigation of **Ama Jirna** (indigestion secondary to toxic accumulation) and **Koshthakathinya** (chronic constipation), alongside the enhancement of **physiological resilience, gastrointestinal motility**, and overall systemic vigor.

1.5.Clinical Evaluation of Dhauti in Gastrointestinal Function

A randomized controlled trial conducted by Kiran, Shashi, et al. (2019)[7] investigated the short-term therapeutic impact of **Laghu Shankha Prakshalana**, a modified variant of Dhauti, on **gastrointestinal functional parameters**. The study enrolled 60 healthy volunteers, of which 30 participants underwent weekly sessions of Laghu Shankha Prakshalana over a 4-week intervention period.

Significant improvements were recorded in digestive efficiency, as measured by validated scoring tools such as the **Cleveland Clinic Constipation Scoring System**, with notable reductions in self-reported symptoms of **bloating, incomplete evacuation**, and **transit time**. In contrast, the non-intervention control group exhibited no statistically meaningful changes in any gastrointestinal indices.

The investigators concluded that Laghu Shankha Prakshalana facilitates **deep colonic cleansing**, optimizes **bowel regularity**, and potentiates the functional dynamics of the **enteric nervous system**, thus making it a viable adjunct in the management of functional bowel disorders.[7]

1.6. Multisystemic Benefits of Laghu Shankha Prakshalana in Chronic Pain Management

In a controlled interventional study by Haldavnekar et al. (2014),[8] 40 subjects diagnosed with **chronic low back pain (CLBP)** were recruited and randomized to receive a combined protocol of **Laghu Shankha Prakshalana** and **therapeutic yoga regimen**.

Clinical outcomes were evaluated using multidimensional indices:

Pain and disability via the **Oswestry Disability Index (ODI)**

Anxiety levels via the **Spielberger State-Trait Anxiety Inventory (STAI)**

Spinal mobility via **Leighton-type caliper goniometric measurement**

Post-intervention analysis revealed significant reductions in pain intensity and anxiety levels, alongside marked improvements in spinal flexibility. The study posited that Laghu Shankha Prakshalana operates through **neuromuscular**

modulation, **viscero-somatic balance**, and **psychological desensitization**, and hence could serve as an **integrative therapeutic model** for the conservative management of CLBP and related musculoskeletal disorders.[8]

1.7. Pulmonary Functional Enhancements Through Kunjal Kriya

Balakrishnan R. (2018)[9] conducted a clinical investigation into the **respiratory benefits** of **Kunjal Kriya**, a subtype of Dhauti involving induced emesis through ingestion of lukewarm saline water.

The intervention led to significant augmentation in **pulmonary performance indicators**, including:

Elevated **Slow Vital Capacity (SVC)**

Prolonged **Breath-Holding Time (BHT)**

Decreased **Respiratory Rate (RR)**

Reduced **Expiratory Reserve Volume (ERV)**

These alterations suggest enhanced **vagal tone**, improved **respiratory muscle endurance**, and decreased **airway resistance**. Such physiological adaptations are of critical relevance in **restrictive lung pathologies** and may provide ancillary benefits in **pulmonary rehabilitation** protocols.[9]

Summary of Empirical Studies on the Therapeutic Efficacy of Dhauti

Author	**Sample Size**	**Study Design & Intervention Duration**	**Variables Assessed**	**Key Findings**
Gayatri (2024)[10]	*n = 40* (Obese individuals aged 18–40 years)	Intervention involving **Laghu Shankh Prakshalana**, performed **once weekly for 8 weeks**	Body Weight, Body Mass Index (BMI), Lipid Profile, Waist-Hip Ratio	Demonstrated statistically significant reductions in body weight, BMI, and waist-hip ratio, indicating a potential cardioprotective effect through modulation of metabolic risk factors.
Behera et al. (2022)[11]	*n = 1* (30-year-old obese female subject)	Daily practice of **Kunjal Kriya** for **40 days** (excluding 7 days of menstrual cycle)	BMI, Body Weight, Waist Circumference, Gastrointestinal Agni (digestive fire) assessment	Reported a reduction of 3 kg in body weight, normalization of BMI, and decrease in waist circumference. Additionally, marked improvement was observed in symptoms like irregular bowel movement and hyperacidity.
Amit Chandra Deshmukh (2021)[12]	*n = 200*, divided into **two experimental groups** (100 each) with **Type 2 Diabetes Mellitus (T2DM)**	Comparative intervention for **90 days**: Group A practiced *Chained Yogic Exercises*, Group B performed *Agnisara Kriya*	Statistical Analysis using Paired t-test	Agnisara Kriya exhibited superior glycemic regulation in T2DM patients compared to traditional chained yogic practices, indicating greater efficacy in metabolic modulation.
Divyashree et al. (2020)[13]	*n = 40* (Patients aged 15–25 years with gastrointestinal issues and migraine)	Practice of **Laghu Shankh Prakshalana**, **thrice within a 10-day interval**	Electrogastrography (EGG), Migraine Disability Assessment (MIDAS), Health Assessment Questionnaire	Intervention resulted in a significant reduction in migraine frequency, along with improved gastrointestinal motility and enhanced quality of life metrics.

Basti (Yogic Enema)

In the classical texts of **Haṭha Yoga**, *Basti* is considered one of the fundamental internal purification practices (*Shatkarma*), aimed at cleansing the colon and maintaining gastrointestinal hygiene. Traditionally, it is practiced in two forms: **Jala Basti** (water-based enema) and **Sthala Basti** (dry enema). Both techniques are designed to eliminate accumulated toxins and balance the internal milieu of the gastrointestinal tract.

According to *Swami Svatmarama*, Basti is instrumental in balancing the **three doshas** (*Vata, Pitta, Kapha*) and in maintaining equilibrium among the *Dhatus* (tissues). *Sage Gheranda* emphasizes Basti's efficacy in mitigating **Vata-induced disorders**, genitourinary ailments, and digestive dysfunctions.[14]

Physiological and Therapeutic Benefits as per Yogic Authorities

Sage *Gheranda*, *Swami Svatmarama*, and *Shrinivasa Yogi* have extensively documented the therapeutic significance of Basti. The practice is acclaimed for its effectiveness in treating **Prameha** (metabolic disorders including diabetes), **Udavarta** (upward movement of Vata), and **abnormal wind retention**, which leads to systemic discomfort.

Basti is known to rectify **gastrointestinal imbalances** (*Koshtha Dosha*), stimulate *Jatharagni* (digestive fire), and alleviate **Ama Vata** and **tridoshic imbalances**. Moreover, it contributes to the resolution of **abdominal tumors (Gulma)**, **splenic enlargement (Pliha Roga)**, and **ascites (Udar Roga)**.[14],[16]

It is believed to purify and revitalize the *Dhatus*, sensory organs, and the mind (*Antahkarana*), promoting luminous vitality and enhanced mental clarity. Regular practice of Basti results in the elimination of toxic residues and vitiated air (*Vata*), thereby improving **homeostasis** and metabolic efficiency. Ultimately, Basti practice transforms the practitioner into a **radiant and disease-free being**, symbolizing divine vigor.

Neti (Yogic Nasal Cleansing)

In classical *Haṭha Yogic* literature, **Neti** is prescribed as a fundamental technique for nasal and sinus purification. Primary references are found in *Hatha Pradipika*, *Gheranda Samhita*, and to some extent in *Hatha Ratnavali*, wherein *Shrinivasa Yogi* describes its significance.

Though classical literature primarily emphasizes **Sutra Neti**, contemporary yogic practice has evolved to include four principal variations:

Jala Neti (using saline water)

Sutra Neti (using thread or catheter)

Dugdha Neti (using milk)

Ghrita Neti (using ghee)

Among these, **Jala Neti** and **Sutra Neti** are most widely practiced and clinically relevant.

Neti not only purifies the nasal passages but also contributes to **mental clarity**, **respiratory health**, and is considered a **natural intervention** for managing **nasal congestion**, **sinusitis**, and other **upper respiratory tract infections (URTIs)** prevalent in modern sedentary lifestyles.[15]

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Jala Neti Technique

This involves the use of **lukewarm isotonic saline solution**, administered via a **Neti pot**, where the fluid is introduced into one nostril and allowed to flow out from the other, thereby flushing the nasal passages.

Sutra Neti Technique

Traditionally practiced with a **thread**, it involves inserting the thread through the nostril and retrieving it through the mouth. In contemporary practice, **latex or silicone catheters** have replaced traditional threads for enhanced safety and hygiene.

Classical Therapeutic Interpretations of Neti in Traditional Yogic Texts

The classical expositions of Hatha Yoga, as authored by Maharshi Gheranda, Yogi Swatmarama, and Yogi Srinivasa, extol the practice of **Neti** as a pivotal kriya for both corporeal and psychological purification. This ancient technique is described as instrumental in cleansing the **kapala** (cranial cavity), thereby fostering heightened mental clarity and enhancing meditative absorption (dhyana).[14,16]

Neti is traditionally prescribed for the expulsion of **Kapha-related morbidities**, and for the prophylaxis and treatment of disorders manifesting above the region of the **jathru** (throat), including **cephalalgia (headaches), sinusitis, and various**

respiratory dysfunctions. The practice is also intimately associated with the attainment of **Khechari Siddhi**, a yogic milestone signifying elevated spiritual consciousness.

Furthermore, consistent engagement with Neti is believed to fortify **immunological defense**, promote **mental tranquility**, and stabilize the **cognitive-emotional apparatus**. Through sustained application, the practitioner is said to attain a state of integrated **psychosomatic equilibrium**, wherein both physical vitality and mental serenity are profoundly optimized.

Neti in the Management of Rhinosinusitis

Heatley DG (2001) conducted a comparative clinical study involving **150 individuals** diagnosed with **chronic rhinosinusitis**, divided into three groups (n=50 each). Group A was assigned **rubber bulb syringe irrigation**, Group B received **nasal reflexology massage**, and Group C was instructed to perform **Jala Neti**. Over a **two-week intervention**, **all three groups exhibited symptomatic improvement**, with Jala Neti showing promising efficacy in nasal clearance and symptom reduction.[17]

In another study, **Shoseyov et al. (1998)** conducted a **double-blind randomized controlled trial** on pediatric patients with **chronic sinusitis**. The results demonstrated that **Jala Neti** was a **statistically effective and safe intervention** for managing sinus inflammation and enhancing mucociliary function.[18]

Effect of Neti (Nasal Irrigation) on Radiation-Induced Sinusitis in Nasopharyngeal Carcinoma: A Review-Based Analysis

A well-structured clinical study conducted by Liang *et al.* (2008) included 107 patients diagnosed with nasopharyngeal carcinoma who developed radiation-induced sinusitis and nasal mucosal irritation following radiotherapy. Since radiotherapy is a primary modality for the treatment of cancers located in the posterior nasal cavity and the upper pharyngeal region, managing post-radiation nasal complications becomes essential. All participants in the study were systematically trained to perform **Neti (nasal irrigation)** regularly. Follow-up assessments conducted at six-month intervals revealed a statistically significant reduction in symptoms, along with notable improvement in quality of life (QoL).[19]

In a similar context, a longitudinal investigative study conducted by Luo HH (2014) monitored patients over a five-year period with continuous follow-up. These patients were also encouraged to practice regular nasal irrigation. As a result, not only was there sustained alleviation of symptoms, but also a long-term and satisfactory enhancement in patients' quality of life was recorded.

From the above studies, it can be inferred that **Neti (nasal irrigation)** may serve as a **non-invasive, practical, and cost-effective intervention** in the management of radiation-induced sinusitis and nasal mucosal irritation. This simple yet scientifically validated technique is emerging as a vital component of long-term supportive care and has demonstrated potential in improving the overall health and quality of life of patients following radiotherapy.[20]

Summary of Empirical Studies on the Efficacy of Neti (Nasal Irrigation)

Author	**Sample Size**	**Study Design and Intervention Duration**	**Variables Assessed**	**Findings**
R.N. Rani (2024)[21]	60 healthy volunteers (16 males, 44 females)	Pre-post intervention study	PNIF (Peak Nasal Inspiratory Flow)	Demonstrated immediate and statistically significant improvement in nasal airflow (inspiratory capacity through the nose).
Sharath K.P.M. (2024)[22]	120 participants (60 in Group 1, 60 in Group 2)	Prospective pre-post design; 11 sessions across 4 weeks	RQLQ and SNOT questionnaires; Quality of Life indices	Group 1 (Sutra Neti + Kapalabhati) showed enhanced QoL outcomes and reduced AEC; effective in prevention of common cold, cough, allergic rhinitis, and tonsillitis.
DivyaT. (2023)[23]	25	Single-group pre-post trial	TNSS (Total Nasal Symptom Score), TOSS (Total Ocular Symptom Score)	Jalaneti and Sopaya Yusha significantly reduced symptoms of allergic rhinitis.
Laden et al. (2017)[24]	32	Qualitative semi-structured interview-based	Medication score, Symptom checklist	Neti was found to be more effective than steam inhalation in reducing rhinosinusitis symptoms.

Author	Sample Size	Study Design and Intervention Duration	Variables Assessed	Findings
		study		
Little et al. (2016)[25]	871 (Standard care = 210; Nasal irrigation = 219; Steam inhalation = 232; Combined = 210)	Randomized Controlled Trial (RCT); 6 months	Rhinosinusitis Disability Index (RSDI)	Nasal irrigation showed superior outcomes compared to steam inhalation in mitigating rhinosinusitis-related disability.
Sandra Y. Lin et al. (2015)[26]	10	Pre-post intervention study; 1-month duration	Sino-Nasal Outcome Test (SNOT) / QoL survey	Nasal irrigation significantly improved chronic sinus symptoms and patient-reported quality of life.
Luo et al. (2014)[27]	1134 (divided into subgroups)	Longitudinal follow-up study over 5 years	Sino-nasal quality of life assessment	Long-term nasal irrigation demonstrated sustained improvements in QoL among chronic sinusitis patients.
Liang et al. (2008)[28]	107 (Irrigation = 44; Non-irrigation = 63)	RCT; 6-month nasal irrigation intervention	Questionnaire and radiological assessments	Post-radiotherapy nasal irrigation significantly improved symptom profiles and quality of life.
Rabago et al. (2002)[29]	76 (Experimental = 52; Control = 24)	RCT; daily hypertonic saline irrigation over 6 months	Clinical outcome survey; RSDI	Neti reduced symptoms and medication dependency in chronic rhinosinusitis patients.
Shoseyov et al. (1998)[30]	30 (Hypertonic saline = 15; Isotonic saline = 15)	Randomized double-blind trial	Radiologic analysis; Nasal secretions	Hypertonic saline irrigation significantly reduced nasal discharge, cough, and mucosal inflammation.
Georgitis (1994)[31]	30	Self-controlled trial	Nasal secretions – Histamine, Prostaglandin D2 levels	Neti and large-particle water vapor significantly decreased nasal inflammation markers.

Lauliki (Nauli): Classical Understanding and Contemporary Appraisal

The primary objective of **Nauli Kriya**, traditionally known as *Lauliki*, lies in the purification of the abdominal region and the fortification of the digestive apparatus. During this practice, the internal abdominal muscles are rhythmically manipulated to induce a dynamic self-massage, thereby enhancing splanchnic blood circulation. This yogic technique is historically regarded as beneficial for maintaining the optimal functioning of the **small intestine and associated digestive organs**. Documented extensively in classical yogic texts, Nauli is revered for its therapeutic and cleansing attributes. However, contemporary biomedical literature has yet to fully validate its physiological mechanisms through rigorous scientific investigation. Due to the complexity and physical demands of this kriya, it is advised that practitioners undertake Nauli exclusively under the guidance of a qualified yoga expert.

Classical Interpretations of Lauliki (Nauli) by Maharshi Gheranda, Yogi Swatmarama, and Yogi Srinivasa

According to authoritative yogic texts by **Maharshi Gheranda, Yogi Swatmarama, and Yogi Srinivasa**, Nauli is proclaimed to be a potent technique for **somatic purification and energetic equilibrium**. It is believed to ignite the **digestive fire (Jatharagni)**, thereby improving gastrointestinal efficiency and catalyzing the internal flow of **vital energy (Prana)**. Nauli is traditionally credited with the eradication of accumulated toxins (*doshas*) and disease entities, ultimately leading to holistic somatic well-being. Additionally, it harmonizes the dual channels of subtle energy—**Ida and Pingala**, reinforcing energetic homeostasis. Often referred to as the **"jewel of Hatha Kriyas"**, Nauli stands as a paramount tool for cultivating both physical robustness and psychological resilience.[32]

Trataka: A Classical Yogic Gaze Stabilization Technique

The term **Trataka** originates from Sanskrit, meaning "to gaze intently." It constitutes a meditative practice wherein the practitioner concentrates unwaveringly upon a fixed object—commonly a candle flame, a black dot, the moon, or the open sky—without blinking, until lacrimation ensues. Beyond being a **contemplative discipline**, Trataka has been traditionally acclaimed for its efficacy in enhancing **visual acuity, mental concentration, and neurological clarity**. Repetitive engagement with this kriya is known to exert salutogenic effects on both **ocular structures and cerebral faculties**.

Classical Insights on Trataka by Maharshi Gheranda, Yogi Swatmarama, and Yogi Srinivasa

As per traditional sources, **Maharshi Gheranda, Yogi Swatmarama, and Yogi Srinivasa** have highlighted Trataka as a profound kriya for **enhancing visual strength, mental steadiness, and spiritual ascent**. It is said to eliminate ocular pathologies and confer a refined, radiant vision. Trataka also dispels **laziness, mental dullness, and instability**, instilling **calmness and meditative depth**. It is considered essential for attaining **Shambhavi Mudra**, a key marker of spiritual awakening. Recognized in the yogic canon as a **highly guarded and effective tool for psychophysical purification**, Trataka facilitates mental lucidity and inward concentration.[32]

Scientific Findings on Trataka

Effects on Attention and Cognitive Performance

Mallik T (2010) conducted a self-controlled study involving 30 participants to evaluate the cognitive effects of Trataka. Assessment was carried out using the **Critical Flicker Fusion (CFF)** technique, both pre- and post-intervention. Following five preparatory training sessions, participants demonstrated a **significant enhancement in CFF thresholds** after Trataka, whereas the control sessions yielded no meaningful changes.[33]

Another study employing the **Stroop Color-Word Test** with 30 participants revealed **improved cognitive processing and executive function** following Trataka practice.[34]

Effects on Autonomic Nervous System

Raghavendra B (2014) assessed **heart rate variability (HRV)** and respiratory rate in participants following several sessions of Trataka. The results indicated a **reduction in heart rate and respiratory frequency**, accompanied by a **decrease in low-frequency components and increase in high-frequency components of HRV**, suggesting enhanced **vagal tone and parasympathetic activation**.[35]

An additional study confirmed that Trataka **promotes parasympathetic dominance** through vagal stimulation, leading to **improved autonomic regulation**, reduced stress biomarkers, and greater physiological relaxation.[36]

Effects on Ocular Function and Vision Disorders

Tiwari K (2018) studied two distinct cohorts—one with normal vision (*emmetropia*) and the other with age-related refractive changes (*presbyopia*). Both groups engaged in **Trataka and ocular exercises based on the Bates Method**. Subjective improvements in vision were reported, although **instrument-based assessments showed no statistically significant change**, suggesting a placebo or psychological influence rather than an optometric improvement.[37]

These findings underscore the necessity for **well-controlled, large-scale clinical trials** to ascertain the long-term ophthalmological and therapeutic impacts of Trataka in vision-related disorders.

Certainly! Here's your summarized table translated into high-level academic English, with terminology appropriate for publication in Scopus-indexed, PubMed, or similar high-impact journals. Numbering is preserved as requested:

Summary of Empirical Studies on Trataka

Author and Year	Sample Size	Study Design and Intervention Duration	Variables Assessed	Findings
Sonal D. Wankhede (2024)[38]	20 participants	Pre-post experimental study; 60 days, 5 sessions per week of Trataka practice	Computer Vision Syndrome Questionnaire and Schirmer Test	Statistically significant improvements were observed in symptoms and discomfort associated with digital eye strain among participants.
Tiwari et al. (2018)[39]	48 (Trataka = 24, Eye Exercises = 24)	Comparative study; 8-week intervention	Snellen Chart	Neither Trataka nor conventional eye exercises produced statistically significant changes in refractive errors.

Author and Year	Sample Size	Study Design and Intervention Duration	Variables Assessed	Findings
Raghavendra & Singh (2016)[40]	30	Self-controlled study; evaluation after a 15-day orientation program and 25-minute sessions of Trataka and control	Stroop Color-Word Test	Enhanced selective attention, cognitive flexibility, and response inhibition were noted following the Trataka session.
Talwadkar et al. (2014)[41]	60 (Trataka group = 36, Control group = 24)	Randomized Controlled Trial (RCT); 26-day intervention	Digit Span Test, Six-Letter Cancellation Test, Trail Making Test	Elderly participants in the Trataka group demonstrated significant cognitive enhancement compared to the control group.
Raghavendra & Ramamurthy (2014)[42]	30	Self-controlled study; post a 15-day orientation program, Trataka and control sessions of 25 minutes	Heart Rate Variability (HRV), Respiratory Rate	Reductions in heart rate, respiratory rate, and low-frequency HRV components, alongside increases in high-frequency components, were recorded in the Trataka group.
Gopinathan et al. (2012)[43]	66 (Eye Exercises = 32, Trataka = 34)	Randomized Controlled Trial; daily practice for 3 weeks	Symptoms of Presbyopia, Retinoscopy, Autorefractor, Keratometer	Both Trataka and eye exercises resulted in subjective symptomatic relief; however, no objective improvements were found in optometric measures.
Malik & Kulkarni (2010)[44]	30	Self-controlled study; five 30-minute sessions of Trataka prior to assessment	Critical Flicker Fusion Frequency (CFF)	A significant elevation in critical flicker fusion thresholds was observed post Trataka sessions, indicating enhanced visual perception.

6. Kapalabhati

The term *Kapalabhati* is derived from two Sanskrit roots—*"Kapala"*, meaning "skull" or "cranium," and *"Bhati"*, meaning "to shine" or "illuminate." This yogic cleansing technique involves forceful expulsion of breath following a passive inhalation while seated in a meditative posture such as *Siddhasana* or *Padmasana*. During this practice, the abdomen is rhythmically contracted and relaxed, aiding in the rapid exhalation of air.

Physiologically, Kapalabhati facilitates the expulsion of carbon dioxide and enhances the oxygenation of internal organs, thus revitalizing systemic functions.

6.1 Classical Interpretations and Therapeutic Benefits According to Traditional Yogic Texts

Renowned yogic scholars such as Maharshi Gheranda, Yogi Swatmarama, and Yogi Srinivasa have extolled the transformative potential of Kapalabhati in their classical treatises. They regard the practice as profoundly purificatory, both somatically and psychologically. It is credited with pacifying *Kapha* and *Pitta* doshas, ameliorating hydrogenic disorders, purifying the cranial cavity (*Kapala*), and stimulating the *Vishuddhi Chakra*, an energetic center associated with spiritual evolution.[45]

Consistent practice is said to enhance vitality, bolster immunity, and infuse the practitioner with renewed vigor. Not only does it fortify the respiratory system, but it also enhances digestive capacity and detoxifies the body. Classical texts affirm that Kapalabhati inhibits senescence and febrile disorders, thereby contributing to systemic resilience. In advanced practitioners, it is reputed to foster divine radiance (*tejas*) and enhanced mental lucidity, rendering them spiritually luminous.

6.2 Effects of Kapalabhati on Metabolism

Desai B.P. (1990) conducted an empirical study involving 12 healthy subjects who performed one minute of Kapalabhati. Post-intervention biochemical analysis revealed a reduction in serum urea levels, accompanied by elevations in creatinine

and tyrosine concentrations. These metabolic changes are attributed to increased cellular respiration due to augmented oxygenation, which in turn accelerates decarboxylation processes. The results suggest that Kapalabhati promotes metabolic optimization and enhances detoxification mechanisms.[46]

6.3 Cardiovascular and Respiratory Implications of Kapalabhati

Stancak et al. (1991) documented that Kapalabhati positively influences cardiovascular dynamics, with particular reference to enhanced baroreflex sensitivity and increased vagal tone. The baroreflex is crucial in regulating arterial pressure, while heightened vagal activity is indicative of improved autonomic balance, cardiac efficiency, and stress resilience.[47] [48]

Electroencephalographic (EEG) analyses conducted post-Kapalabhati practice have shown an increase in slow-wave activity during resting states, which correlates with reduced anxiety and heightened mental calmness.[49]

Telles S. et al. (2015)[50] employed Event-Related Potential (ERP) protocols to evaluate cognitive performance and attentional capacity in subjects post-Kapalabhati. The study recorded significant improvements in cognitive markers alongside a reduction in anxiety levels, affirming the psychophysiological efficacy of this pranayama.[50]

Additional investigations noted transient activation of the sympathetic nervous system and an elevation in metabolic rate during the practice. However, contrary to expectations, no significant increase in cerebral blood flow to the prefrontal cortex was observed.[51]

6.4 Cognitive Enhancements Associated with Kapalabhati

Another line of research has demonstrated that regular engagement with Kapalabhati contributes to improved cognitive functioning.[52] Practitioners exhibit enhanced mental clarity, attentional stability, and reduced stress reactivity. These findings collectively support the hypothesis that Kapalabhati serves as a dual-action intervention—simultaneously enhancing both physical health and neurocognitive performance.

Summary of Empirical Studies on Kapalabhati

Author and Year	**Sample Size**	**Study Design and Intervention Duration**	**Variables Assessed**	**Findings**
Dinkar Kekan (2024)[53]	Total 60 (30 experimental, 30 control)	8-week intervention	Peak Expiratory Flow Rate (PEFR), analyzed using paired t-test	Significant enhancement in PEFR was observed, indicating improved pulmonary function.
Nootan Beniwal (2023)[54]	60 participants across four groups (three experimental, one control)	Randomized, 8 weeks	Vital capacity, peak flow rate, breath-holding time, and blood pressure (systolic and diastolic)	Kapalabhati practice led to statistically significant improvements in all physiological variables except systolic blood pressure, which showed no significant change.
Varun Malhotra (2021)[55]	20 participants	Prospective interventional study; 2 months	Heart Rate Variability (HRV) and psychophysiological parameters (assessed using Dinamika HRV—Advanced HRV Test System, Moscow, Russia)	Increased heart rate, LF power (nu%), LF/HF ratio, LF%, and VLF% were noted post-practice. Beta and gamma brainwaves increased after Kapalabhati, while theta and alpha waves remained relatively unchanged during the practice.
Shirley Telles et al. (2019)[56]	61 pre-teen children	2 years; three 18-minute intervention groups: (1) High-frequency yogic breathing, (2) Yoga-based breath awareness, (3) Quiet sitting	Attention assessed via Six-Letter Cancellation Task; anxiety assessed via Spielberger's State-Trait Anxiety Inventory (STAI-S)	All three practices reduced anxiety. The high-frequency yogic breathing group showed enhanced attention scores, whereas the breath-awareness group exhibited an increased number of errors post-intervention.
Baljinder	28 participants	Retrospective cross-	Cardiorespiratory endurance	Statistically significant

Author and Year	Sample Size	Study Design and Intervention Duration	Variables Assessed	Findings
(2015)[57]	(Kapalabhati = 14, Control = 14)	sectional study; 4-week duration	(Cooper 12-Minute Run Test), muscular strength (Sit-up Test), muscular endurance (Push-up Test), flexibility (Sit-and-Reach Test), body fat and lean tissue (Hydrostatic Weighing)	improvements were found in cardiorespiratory endurance, flexibility, body fat percentage, fat weight, and lean body mass in the Kapalabhati group.

2. CONCLUSION

In the context of managing modern lifestyle disorders—such as obesity, stress, hypertension, respiratory dysfunctions, and gastrointestinal disturbances—**Ṣaṭkarma** emerges as a potent, non-invasive, and natural therapeutic modality. Rooted in the classical tradition of Haṭha Yoga, these yogic cleansing practices aim not merely at physical detoxification but at holistic purification and harmonization of the body–mind complex, thereby fostering optimal psychosomatic health.

A comprehensive review of contemporary literature and empirical studies suggests that **Ṣaṭkarma** operates across multiple physiological domains, including somatic, metabolic, and cognitive levels. Furthermore, these practices play a preventive and therapeutic role in both acute and chronic disease conditions.

Dhauti has been consistently shown to enhance gastrointestinal and respiratory efficiency and is therapeutically beneficial in digestive disorders.

Neti, particularly *Jala Neti*, has demonstrated significant clinical efficacy in nasal hygiene and in the management of rhinosinusitis and upper respiratory tract infections.

Trāṭaka facilitates the enhancement of concentration, visual focus, and mental equilibrium, and is associated with increased parasympathetic dominance, suggesting its utility in stress regulation and mental relaxation.

Kapalabhati has shown evidence-based benefits in improving pulmonary function, metabolic rate, and neurocognitive performance, while concurrently reducing perceived stress and elevating subjective energy levels.

When practiced under the supervision of qualified instructors and in adherence to appropriate safety guidelines, **Ṣaṭkarma techniques** have been found to be both safe and efficacious. These interventions offer a low-cost, accessible, and sustainable approach to preventive healthcare, physical and mental purification, and the management of lifestyle-related disorders.

However, to establish their scientific credibility and promote their integration into global health systems, **well-designed, randomized controlled trials (RCTs)** with large sample sizes and long-term follow-up are imperative. The strategic integration of these time-honored yogic practices with contemporary biomedical frameworks holds immense promise for enhancing public health and advancing integrative medicine on a global scale. .

REFERENCES

[1] Satyarthi, J. A. D. (n.d.). Towards the East (p. 5)

[2] Saraswati, Swami Divyananda. (n.d.). Yoga science in the Vedas (Chapter 6: 5, 6, 7, 9, 25).

[3] Saraswati, Swami Niranjanananda. (2011). Gheranda Samhita (Reprint ed., pp. 23–27). Yoga Publication Trust, Ganga Darshan, Munger, Bihar, India.

[4] Jain, Rajeev Triloki. (2015). Complete Yoga Science (4th ed.).

[5] https://acrobat.adobe.com/id/urn:aaid:sc:AP:16aef696-db4e-4598-ac95-f22a98035e9f

[6] Saraswati, Swami Niranjanananda. (2011). Gheranda Samhita (Reprint ed., pp. 23–79). Yoga Publication Trust, Ganga Darshan, Munger, Bihar, India.Pitambara Peeth. (2003). Gheranda Samhita (4th ed., pp. 8–16). Shri Pitambara Peeth Sanskrit Parishad, Datia, Madhya Pradesh,

[7] India.S, Kiran et al.,(2019) Effect of yogic colon cleansing (laghu sankhaprakshalana kriya) on bowel health in normal individuals. Yoga Mimamsa 51:26 https://www.researchgate.net/publication/336607183_Effect_of_yogic_colon_cleansing_laghu_sankhaprakshalana_kriya_on_bowel_health_in_normal_individuals

[8] P, Tekur et al.,(2014), Effect of yogic coloncleansing (Laghu Sankhaprakshalana Kriya) on pain, spinal flexibility,disability and state anxiety in chronic low back pain. Int J Yoga 7:111.

[9] https://doi.org/10.4103/0973-6131.133884.

[10] R, Balakrishnan et al., (2018), .Voluntarily induced vomiting -a yoga technique to enhance pulmonary functions in healthy humans. J Ayurveda Integr Med 2018;9:213e6 https://doi.org/10.1016/j.jaim.2017.07.001

[11] Annamalai,Gayathri et al., (2024)Effects of Laghoo Shankaprakshalana (yogic colon cleansing) on anthropometric measurements in obese individuals

[12] https://pubmed.ncbi.nlm.nih.gov/38708964/

[13] Behera,Mitanjali et al.,(2022), Effect of kunjal kriya along with ayurveda diet on obese volunteer - a case report

[14] https://www.researchgate.net/publication/358693242_Effect_of_kunjal_kriya_along_with_ayurveda_diet_on_obese_volunteer_-_a_case_report

[15] Deshmukh. Amit Chandra (2021) COMPARATIVE STUDY OF EFFECT OF CHAIN YOGIC EXERCISE (YOGASANA) AND YOGIC THERAPY (AGNISAR KRIYA) FOR REHABILITATION OF TYPE 2 DIABETES MELLITUS (T2D)

[16] https://www.researchgate.net/publication/353811853_COMPARATIVE_STUDY_OF_EFFECT_OF_CHAIN_YOGIC_EXERCISE_YOGASANA_AND_YOGIC_THERAPY_AGNISAR_KRIYA_FOR_REHABILITATION_OF_TYPE_2_DIABETES_MELLITUS_T2D

[17] Y.Divyashree et al.,(2020).Effects Of Laghu Shanka Prakshalana (Yogic Colon Cleansing) On Migraineurs With Abdominal Discomfort-A Prospective Study. IAETSD Journal for Advanced Research In Applied Sciences, vii(ix), 13–26. .

[18] Saraswati, Swami Niranjanananda. (2011). Gheranda Samhita (Reprint ed., pp. 80–87). Yoga Publication Trust, Ganga Darshan, Munger, Bihar, India

[19] Jain, Rajeev Triloki. (2015). Complete Yoga Science (4th ed.).

[20] https://acrobat.adobe.com/id/urn:aaid:sc:AP:16aef696-db4e-4598-ac95-f22a98035e9f

[21] Swatmarama. (1874). Hatha Yoga Pradipika (pp. 62–63). Khemaraja Shri Krishna Das Shreshtha, Shri Venkateshwar (Steam) Printing Press, Mumbai.

[22] Heatley DG, McConnell KE, Kille TL, Leverson GE. Nasal irrigation for the alleviation of sinonasal symptoms. Otolaryngol Head Neck Surg 2001;125:44e8. https://doi.org/10.1067/mhn.2001.115909

[23] hypertonic saline versus normal saline nasal wash of pediatric chronicsinusitis. J Allergy Clin Immunol 1998;101:602e5. https://doi.org/10.1016/S0091-6749(98)70166-6.

[24] Liang K-L, Kao T-C, Lin J-C, Tseng H-C, Su M-C, Hsin C-H, et al. Nasal irrigation reduces postirradiation rhinosinusitis in patients with nasopharyngeal carci-noma. Am J Rhinol 2008;22:258e62. https://doi.org/10.2500/ajr.2008.22.3166

[25] Luo HH, Fu ZC, Cheng HH, Liao SG, Li DS, Cheng LP. Clinical observation and quality of life in terms of nasal sinusitis after radiotherapy for nasopharyngeal carcinoma: long-term results from different nasal irrigation techniques. Br J Radiol 2014;87. https://doi.org/10.1259/bjr.20140043.

[26] R. N. Rani (2024),Immediate Effect of Jala Neti (Nasal Irrigation) on Nasal Peak Inspiratory Flow on Healthy Volunteers

[27] https://www.researchgate.net/publication/382187148_Immediate_Effect_of_Jala_Neti_Nasal_Irrigation_on_Nasal_PeakInspiratory_Flow_on_Healthy_Volunteers

[28] Sharath K.P.M et al ,, (2024) IMPACT OF SUTRA NETI ON ABSOLUTE EOSINOPHIL COUNT AND QUALITY OF LIFE IN INDIVIDUALS WITH ALLERGIC RHINITIS - A PROSPECTIVE RANDOMISED CONTROLLED TRIAL

[29] https://dx.doi.org/10.21474/IJAR01/18268

[30] Divya. T (2023), EFFECT OF JALA NETI AND SOOPYA YOOSHA IN ALLERGIC RHINITIS https://doi.org/10.47070/ijapr.v12i1.3083

[31] Leydon GM, McDermott L, Thomas T, Halls A, Holdstock-Brown B,Petley S, et al. “Well, it literally stops me from having a life when it ’sreally bad”: a nested qualitative interview study of patient views on the use of self-management treatments for the management of recurrent sinusitis (SNIFS trial). BMJ Open 2017;7

[32] https://doi.org/10.1136/bmjopen-2017-017130

[33] Little P, Mullee M, Stuart B, Thomas T, Johnson S, Leydon G, et al.Effec- tiveness of steam inhalation and nasal irrigation for chronic or recurrent sinus symptoms in primary care: a pragmatic randomized controlled trial.CMAJ (Can Med Assoc J) 2016;188:940e9.

[34] https://doi.org/10.1503/cmaj.160362.

[35] . Lin SY, Baugher KM, Brown DJ, Ishman SL. Effects of nasal saline lavage on pediatric sinusitis symptoms and disease-specific quality of life: a case series of 10 patients. Ear Nose Throat J 2015;94:E13 https://doi.org/10.1177/014556131509400212

[36] . Luo HH, Fu ZC, Cheng HH, Liao SG, Li DS, Cheng LP. Clinical observation and quality of life in terms of nasal sinusitis after radiotherapy for nasopharyngeal carcinoma: long-term results from different nasal irrigation techniques. Br J Radiol 2014;87.

[37] https://doi.org/10.1259/bjr.20140043.

[38] Liang K-L, Kao T-C, Lin J-C, Tseng H-C, Su M-C, Hsin C-H, et al.Nasal irrigation reduces postirradiation rhinosinusitis in patients with nasopharyngeal carci- noma. Am J Rhinol 2008;22:258e62.

[39] https://doi.org/10.2500/ajr.2008.22.3166.

[40] Rabago D, Zgierska A, Mundt M, Barrett B, Bobula J, Maberry R. Efficacy of daily hypertonic saline nasal irrigation among patients with sinusitis: a ran- domized controlled trial. J Fam Pract 2002;51:1049e55.

[41] Shoseyov D, Bibi H, Shai P, Shoseyov N, Shazberg G, Hurvitz H. Treatment with hypertonic saline versus normal saline nasal wash of pediatric chronic sinusitis. J Allergy Clin Immunol 1998;101:602e5.

[42] https://doi.org/10.1016/S0091-6749(98)70166-6

[43] Georgitis JW. Nasal hyperthermia and simple irrigation for perennial rhinitis: changes in inflammatory mediators. Chest 1994;106:1487e92. https://doi.org/10.1378/chest.106.5.1487.

[44] Saraswati, Swami Niranjanananda. (2011). Gheranda Samhita (Reprint ed., pp. 106–112). Yoga Publication Trust, Ganga Darshan, Munger, Bihar, India.

[45] Mallick T, Kulkarni R. The effect of trataka, a yogic visual concentration practice, on critical flicker fusion. J Alternative Compl Med 2010;16:1265e7. https://doi.org/10.1089/acm.2010.0012.

[46] Raghavendra BR, Singh P. Immediate effect of yogic visual concentration on cognitive performance. J Tradit Complement Med 2016;6:34e6. https://doi.org/10.1016/j.jtcme.2014.11.030.

[47] Raghavendra B, Ramamurthy V. Changes in heart rate variability following yogic visual concentration (Trataka). Hear India 2014;2:15. https://doi.org/10.4103/2321-449X.127975.

[48] Talwadkar S, Jagannathan A, Raghuram N. Effect of trataka on cognitive functions in the elderly. Int J Yoga 2014;7:96e103. https://doi.org/10.4103/0973-6131.133872.

[49] Gopinathan G, Dhiman KS, Manjusha R. A clinical study to evaluate the efficacy of Trataka Yoga Kriya and eye exercises (non-pharmacological methods) in the management of Timira (Ammetropia and Presbyopia). Ayu 2012;33:543e6. https://doi.org/10.4103/0974-8520.110534.

[50] Sonal D. Wankhede (2024), EFFECT OF YOGIC SHUDDHIKRIYA-TRATAK AND TIL TAIL-NASYA IN THE MANAGEMENT OF COMPUTER VISION SYNDROME (DIGITAL EYE STRAIN) IN WORK PROFESSIONALS https://dx.doi.org/10.21474/IJAR01/18623

[51] Tiwari KK, Shaik R, Aparna B, Brundavanam R. A comparative study on the effects of vintage nonpharmacological techniques in reducing myopia (bates eye exercise therapy vs. Trataka yoga kriya).

[52] Int J Yoga 2018;11:72e6. https://doi.org/10.4103/ijoy.IJOY_59_16.

[53] Raghavendra BR, Singh P. Immediate effect of yogic visual concentration on cognitive performance. J Tradit Complement Med 2016;6:34e6. https://doi.org/10.1016/j.jtcme.2014.11.030.

[54] Talwadkar S, Jagannathan A, Raghuram N. Effect of trataka on cognitive functions in the elderly. Int J Yoga 2014;7:96e103. https://doi.org/10.4103/0973-6131.133872

[55] Raghavendra B, Ramamurthy V. Changes in heart rate variability following yogic visual concentration (Trataka). Hear India 2014;2:15. https://doi.org/10.4103/2321-449X.127975

[56] Gopinathan G, Dhiman KS, Manjusha R. A clinical study to evaluate the efficacy of Trataka Yoga Kriya and eye exercises (non-pharmacological methods) in the management of Timira (Ammetropia and Presbyopia). Ayu 2012;33:543e6. https://doi.org/10.4103/0974-8520.110534.

[57] Mallick T, Kulkarni R. The effect of trataka, a yogic visual concentration practice, on critical flicker fusion. J Alternative Compl Med 2010;16:1265e7. https://doi.org/10.1089/acm.2010.0012.

[58] Saraswati, Swami Niranjanananda. (2011). Gheranda Samhita (Reprint ed., pp. 113–120). Yoga Publication Trust, Ganga Darshan, Munger, Bihar, India.

[59] Desai BP, Gharote ML. Effect of Kapalabhati on blood urea, creatinine and tyrosine. Act Nerv Super (Praha)

1990;32:95e8

[60] Stancak A, Kuna M, Nov ak P, Srinivasan MA, Dostalek C, Vishnudevananda S.Observations on respiratory and cardiovascular rhythmicities during yogic high-frequency respiration. Physiol Res 1991;40:345e54.

[61] Stancak A, Kuna M, Srinivasan, Dost alek C, Vishnudevananda S. Kapalabhati yogic cleansing exercise. II. EEG topography analysis. Homeost Health & Dis 1991;33:182e9.

[62] Telles S, Gupta RK, Gandharva K, Vishwakarma B, Kala N, Balkrishna A. Immediate effect of a yoga breathing practice on attention and anxiety in preteen children. Child (Basel, Switzerland) 2019;6:84. https://doi.org/10.3390/children6070084.

[63] Joshi M, Telles S. A nonrandomized non-naive comparative study of the effects of kapalabhati and breath awareness on event-related potentials in trained yoga practitioners. J Alternative Compl Med 2009;15:281e5. https://doi.org/10.1089/acm.2008.0250.

[64] Pradhan B. Effect of kapalabhati on performance of six-letter cancellation and digit letter substitution task in adults. Int J Yoga 2013;6:128e30. https://doi.org/10.4103/0973-6131.113415

[65] Nivethitha L, Mooventhan A, Manjunath NK, Bathala L, Sharma VK. Cerebrovascular hemodynamics during the practice of bhramari pranayama, kapalbhati and bahir-kumbhaka: an exploratory study. Appl PsychophysiolBiofeedback 2018;43:87e92. https://doi.org/10.1007/s10484-017-9387-8.

[66] Dinkar Kekan (2023), Effect of Kapalbhati pranayama on peak expiratory flow rate in healthy individuals https://www.njppp.com/?mno=147820 http://dx.doi.org/10.5455/njppp.2024.14.03159202330012024

[67] Nutan beniwa (2023),Effect Of Kapalbhati In Different Time Durations On Selected Physiological Variables Among School Girls

[68] https://jrtdd.com/index.php/journal/article/view/2509

[69] Varun Malhotra (2021), Study of immediate neurological and autonomic changes during kapalbhati pranayama in yoga practitioners https://pmc.ncbi.nlm.nih.gov/articles/PMC8963645/

[70] Shirley Telles, (2019)I mmediate Effect of a Yoga Breathing Practice on Attention and Anxiety in Pre-Teen Children

[71] https://pmc.ncbi.nlm.nih.gov/articles/PMC6678429

[72] Bal, Baljinder Singh (2015) mpact of Short-Term Training of Kapalbhati Pranayama on Components of Health-Related Fitness

[73] https://dergipark.org.tr/en/pub/intjscs/article/108379 .