



Role Of Surya Namaskar With And Without Mantra In Stress Modulation: An Ayurvedic And Modern Physiological Conceptual Review

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ABSTRACT

Stress is one of the major psycho-physiological health concerns affecting college students due to academic burden, emotional instability, competitive lifestyle, disturbed sleep, and psychosocial imbalance. Persistent stress negatively influences concentration, memory, emotional stability, immunity, sleep quality, academic performance, and overall quality of life. Modern physiology explains stress through activation of the hypothalamic-pituitary-adrenal (HPA) axis and sympathetic nervous system, resulting in increased secretion of cortisol and catecholamines. Ayurveda explains stress-related manifestations through concepts such as Chinta, Vishada, Bhaya, Atatvabhinivesha, and imbalance of Raja and Tama Dosha affecting Manas and Manovaha Srotas.

Surya Namaskar is a classical yogic practice consisting of twelve sequential postures coordinated with controlled breathing. It positively influences physical fitness, autonomic balance, neuroendocrine regulation, respiratory efficiency, concentration, and emotional stability. Traditional Surya Namaskar practiced with mantra chanting may further enhance mindfulness, psycho-spiritual harmony, parasympathetic dominance, and mental relaxation.

The present conceptual review aims to evaluate the role of Surya Namaskar with and without mantra in stress modulation through Ayurvedic and modern physiological perspectives with special reference to Sharir Prakruti and Kriya Sharir principles. Literature for this review was collected from classical Ayurvedic texts,

yoga literature, modern physiology textbooks, and peer-reviewed research articles indexed in scientific databases.

The review highlights the effects of Surya Namaskar on autonomic balance, neuroendocrine regulation, Raja-Tama imbalance, Ojas, Manovaha Srotas, and psycho-physiological functioning. The review suggests that Surya Namaskar may serve as a safe, economical, and non-pharmacological approach for stress management. Addition of mantra chanting may further improve emotional regulation, concentration, and stress adaptability. Further clinical and observational studies are required for scientific validation.

Keywords: Stress, Surya Namaskar, Mantra, Stress Modulation, Kriya Sharir, Sharir Prakruti, Yoga, Ayurveda.

INTRODUCTION

Stress has become one of the most important health concerns affecting students in modern academic life. Increased educational competition, examination pressure, academic workload, emotional conflicts, social expectations, disturbed sleep patterns, and uncertainty regarding future career opportunities contribute significantly to stress among college students [1].

Persistent stress adversely affects emotional stability, concentration, memory, sleep quality, immunity, interpersonal relationships, and academic performance. Chronic stress also predisposes individuals to anxiety disorders, depression, psychosomatic disorders, hypertension, metabolic disturbances, and reduced quality of life [2].

Modern medicine explains stress through activation of the hypothalamic-pituitary-adrenal axis and sympathetic nervous system. Stress stimulates secretion of cortisol, adrenaline, and noradrenaline, producing autonomic imbalance and neuroendocrine disturbances [3].

Ayurveda considers health as equilibrium of Dosha, Dhatu, Mala, Agni, and Manas. Although the exact term “stress” is not directly mentioned in classical Ayurvedic texts, conditions such as Chinta, Vishada, Bhaya, Krodha, Atatvabhinivesha, and Avichalita Chitta resemble stress-related manifestations [4].

Mental disturbances mainly occur due to vitiation of Raja and Tama Dosha affecting Manas and Manovaha Srotas. Psychological disturbances also influence Prana Vata, Sadhaka Pitta, Tarpaka Kapha, Ojas, and Hridaya.

Sharir Prakruti represents the constitutional makeup of an individual and determines physical, physiological, and psychological characteristics. Ayurveda explains that susceptibility and response to stress vary according to Prakruti predominance [5].

Surya Namaskar is a classical yogic practice involving twelve sequential postures synchronized with breathing regulation. It acts as a complete psycho-neuro-muscular and cardio-respiratory exercise improving circulation, respiratory efficiency, flexibility, endocrine balance, and mental relaxation [6].

Traditional Surya Namaskar practiced with mantra chanting may further improve concentration, emotional stability, mindfulness, and psycho-spiritual harmony.

Hence, the present conceptual review was undertaken to evaluate the role of Surya Namaskar with and without mantra in stress modulation through Ayurvedic and modern physiological perspectives.

MATERIALS AND METHODS

Literature for the present conceptual review was collected from classical Ayurvedic texts including Charaka Samhita, Sushruta Samhita, and Ashtanga Hridaya along with modern medical physiology textbooks and published research articles related to yoga, stress physiology, Surya Namaskar, mantra chanting, and Ayurveda.

Electronic databases including Google Scholar and PubMed were reviewed for relevant peer-reviewed literature. Keywords used for literature search included “Stress,” “Surya Namaskar,” “Mantra,” “Yoga and Stress,” “Autonomic Balance,” “Prakruti,” and “Kriya Sharir.” Relevant conceptual, observational, and review-based literature was included for analysis.

CONCEPT OF STRESS

Stress is the physiological and psychological response of the body to internal or external demands. Moderate stress may improve alertness and performance, whereas prolonged stress adversely affects physical and mental health.

College students are particularly vulnerable to stress due to academic competition, examination pressure, emotional instability, social adjustment, and future uncertainty.

Psychological manifestations of stress include anxiety, irritability, anger, fear, frustration, emotional instability, and depression. Physical manifestations include headache, fatigue, insomnia, digestive disturbances, palpitations, body ache, and reduced immunity.

Modern physiology explains stress through activation of the HPA axis and sympathetic nervous system resulting in increased secretion of cortisol and catecholamines [3]. Persistent sympathetic overactivity may lead to autonomic imbalance, sleep disturbances, hypertension, metabolic disorders, and psychosomatic illness.

STRESS ACCORDING TO AYURVEDA

Ayurveda explains health as equilibrium of Dosha, Dhatu, Mala, Agni, and Manas. Disturbance in this equilibrium results in disease manifestation.

Although the exact term “stress” is not directly described in Ayurvedic classics, conditions such as Chinta, Vishada, Bhaya, Krodha, Atatvabhinivesha, and Avichalita Chitta resemble stress-related disturbances [4].

Mental disturbances mainly occur due to vitiation of Raja and Tama Dosha. Excessive Raja causes restlessness, emotional instability, hyperactivity, irritability, and anger, whereas increased Tama produces fear, confusion, depression, lack of enthusiasm, and reduced mental clarity.

Ayurveda explains that emotional strain, Prajnaparadha, suppression of natural urges, irregular lifestyle, and improper Ahara-Vihara contribute significantly to mental imbalance.

Charaka Samhita explains that prolonged psychological disturbances may result in Ojokshaya leading to reduced Bala, fatigue, reduced immunity, emotional instability, and impaired adaptability.

SHARIR PRAKRUTI AND STRESS

Sharir Prakruti refers to the constitutional makeup of an individual determined at the time of conception according to predominance of Dosha.

Vata Prakruti

Vata dominant individuals generally exhibit emotional sensitivity, anxiety, fearfulness, instability, irregular sleep, and reduced stress tolerance.

Pitta Prakruti

Pitta dominant individuals often demonstrate ambition, competitiveness, irritability, anger, and intolerance under stressful conditions.

Kapha Prakruti

Kapha dominant individuals are usually calm, emotionally stable, patient, and comparatively more stress tolerant.

Assessment of stress according to Sharir Prakruti may help in understanding individual variations in stress perception, coping ability, and therapeutic response.

KRIYA SHARIR PERSPECTIVE OF STRESS

In Kriya Sharir, maintenance of equilibrium of Dosha, Dhatu, Mala, Agni, and Manas is essential for preservation of health.

Stress significantly influences Prana Vata, Udana Vata, and Vyana Vata. Disturbance of Prana Vata may manifest as anxiety, insomnia, fearfulness, disturbed concentration, and emotional instability.

Sadhaka Pitta regulates intellect, confidence, courage, emotional processing, and psychological adaptability. Excessive stress may vitiate Sadhaka Pitta leading to anger, frustration, irritability, and emotional instability.

Tarpaka Kapha nourishes the nervous system and maintains mental calmness. Depletion of Tarpaka Kapha may contribute to anxiety, disturbed sleep, and reduced emotional endurance.

Hridaya is considered the seat of Chetana and Manas. Psychological disturbances influence Hridaya and Manovaha Srotas resulting in psycho-physiological imbalance.

PHYSIOLOGY OF STRESS

Stress activates the hypothalamic-pituitary-adrenal axis resulting in secretion of cortisol from the adrenal cortex. The sympathetic nervous system simultaneously stimulates release of adrenaline and noradrenaline producing the “fight or flight” response [3].

These changes increase heart rate, blood pressure, respiratory rate, muscle tension, and metabolic activity. Persistent stress results in autonomic imbalance, sympathetic overactivity, impaired sleep, digestive disturbances, reduced immunity, and neuroendocrine dysfunction.

Chronic elevation of cortisol negatively affects memory, concentration, emotional regulation, immune response, and psychological stability.

SURYA NAMASKAR

Surya Namaskar is one of the most important yogic practices consisting of twelve sequential postures coordinated with breathing regulation.

It acts as a complete psycho-neuro-muscular and cardio-respiratory exercise influencing multiple physiological systems simultaneously. Regular practice improves flexibility, muscular strength, respiratory efficiency, circulation, cardiovascular endurance, endocrine balance, and neuromuscular coordination [6].

It also improves concentration, emotional stability, relaxation, and mental calmness.

TWELVE STEPS OF SURYA NAMASKAR

Step	Posture	Mantra
1	Pranamasana	Om Mitraya Namah
2	Hasta Uttanasana	Om Ravaye Namah
3	Padahastasana	Om Suryaya Namah
4	Ashwa Sanchalanasana	Om Bhanave Namah
5	Dandasana	Om Khagaya Namah
6	Ashtanga Namaskara	Om Pushne Namah
7	Bhujangasana	Om Hiranyagarbhaya Namah
8	Parvatasana	Om Marichaye Namah
9	Ashwa Sanchalanasana	Om Adityaya Namah
10	Padahastasana	Om Savitre Namah
11	Hasta Uttanasana	Om Arkaya Namah
12	Pranamasana	Om Bhaskaraya Namah



MECHANISM OF ACTION OF SURYA NAMASKAR IN STRESS MODULATION

Surya Namaskar acts through integrated physical, respiratory, autonomic, endocrine, neurological, and psychological mechanisms.

The sequential postures combined with rhythmic breathing improve circulation, oxygenation, flexibility, muscular tone, respiratory efficiency, and autonomic balance. Regular practice reduces sympathetic overactivity and enhances parasympathetic dominance, thereby helping regulate stress response and emotional stability [7].

Controlled breathing during Surya Namaskar improves vagal tone and neuroendocrine balance while reducing physiological arousal associated with stress. Practice of Surya Namaskar may also help reduce cortisol levels, improve concentration, emotional regulation, sleep quality, and mental relaxation.

From an Ayurvedic perspective, Surya Namaskar helps regulate Prana Vata, Udana Vata, and Vyana Vata while improving circulation of Rasa and Rakta and maintaining psycho-physiological balance.

MECHANISM OF ACTION OF MANTRA IN STRESS MODULATION

Mantra chanting is an important component of traditional yogic practices and has significant effects on psychological, neurological, autonomic, and psycho-spiritual functioning. In Surya Namaskar, addition of mantra chanting enhances the overall therapeutic and stress-modulating effects by integrating body movements, breathing regulation, concentration, and sound vibration.

From the modern physiological perspective, stress activates the hypothalamic-pituitary-adrenal axis and sympathetic nervous system leading to increased secretion of cortisol, adrenaline, and noradrenaline. Persistent activation of these pathways produces anxiety, insomnia, autonomic imbalance, impaired concentration, and psychological exhaustion.

Mantra chanting produces rhythmic auditory stimulation which helps calm excessive cortical activity and mental fluctuations. Repetitive chanting creates synchronization between respiration, neural activity, and mental concentration, thereby inducing a relaxation response within the body.

Rhythmic pronunciation of mantra slows respiratory rate and enhances vagal stimulation, which increases parasympathetic dominance and reduces sympathetic overactivity. Improvement in parasympathetic activity helps regulate heart rate, respiratory rate, blood pressure, and emotional responses associated with stress.

Continuous chanting also improves oxygenation and breathing efficiency through controlled respiration. Slow and rhythmic breathing associated with mantra chanting reduces physiological arousal and produces mental calmness.

Neurophysiologically, mantra chanting may influence brain regions associated with emotional processing, concentration, memory, attention, and stress regulation. Repetitive sound vibrations may reduce excessive neural excitability and improve emotional stability.

Several studies suggest that meditative chanting practices may reduce cortisol levels and positively influence neurotransmitters responsible for relaxation, emotional balance, and psychological well-being [8]. Chanting also improves mindfulness, concentration, self-awareness, and emotional endurance.

From an Ayurvedic perspective, mantra primarily acts on Manas and Manovaha Srotas. Stress-related manifestations are mainly associated with vitiation of Raja and Tama Dosha. Excessive Raja produces restlessness, irritability, hyperactivity, and emotional instability, whereas increased Tama produces fear, confusion, depression, and lack of mental clarity.

Mantra chanting helps reduce Raja-Tama predominance and promotes Satva Guna, which is responsible for mental purity, emotional balance, clarity of intellect, concentration, and psychological stability.

Mantra also influences Prana Vata, which governs higher mental activities, concentration, sensory perception, and emotional control. Stabilization of Prana Vata improves mental calmness and reduces anxiety, fearfulness, and disturbed concentration.

Sadhaka Pitta, responsible for intellect, confidence, emotional processing, courage, and psychological adaptability, may also become balanced through regular mantra chanting. Tarpaka Kapha, which nourishes the nervous system and provides emotional stability and mental calmness, may also improve through meditative and chanting practices.

The vibrational effect of mantra may positively influence psycho-neuro-endocrine pathways and autonomic balance. Repetitive chanting creates a meditative state that helps reduce stress perception and improves adaptability toward emotional and environmental stressors.

Thus, mantra chanting helps modulate stress through combined effects on autonomic regulation, neuroendocrine balance, respiration, mental concentration, emotional stability, Satva enhancement, and psycho-spiritual harmony. When combined with Surya Namaskar, mantra chanting may provide superior psycho-physiological benefits compared to physical practice alone.

NEUROPHYSIOLOGICAL EFFECTS OF SURYA NAMASKAR ON STRESS

Surya Namaskar positively influences autonomic nervous system functioning by reducing sympathetic overactivity and enhancing parasympathetic dominance.

Controlled breathing and rhythmic movements regulate respiratory centers, improve oxygenation, and reduce physiological stress responses.

Regular practice may decrease cortisol levels, improve vagal tone, regulate heart rate variability, and enhance neuroendocrine balance [9]. Yoga practices including Surya Namaskar also improve neurotransmitter regulation and emotional processing.

Mantra chanting may further influence cortical activity, concentration, emotional regulation, and relaxation response.

MANOVAHA SROTAS AND MENTAL HEALTH

Manovaha Srotas are responsible for mental activities and psychological functioning. Hridaya and Dasha Dhamani are considered the roots of Manovaha Srotas.

Disturbance in these channels due to emotional stress, fear, anger, grief, irregular lifestyle, and Prajnaparadha leads to anxiety, insomnia, irritability, depression, emotional instability, and disturbed concentration.

Ayurveda emphasizes Yoga, meditation, Satvika Ahara, Pranayama, and proper lifestyle modifications for preservation of mental health.

OJAS AND STRESS

Ojas is considered the essence of all Dhatu and is responsible for immunity, vitality, enthusiasm, mental stability, and overall well-being.

Excessive stress and emotional disturbances may result in Ojokshaya characterized by fatigue, weakness, anxiety, disturbed sleep, reduced immunity, and impaired adaptability.

Yoga, meditation, adequate sleep, proper nutrition, and positive mental attitude help preserve Ojas and improve stress adaptability.

BENEFITS OF SURYA NAMASKAR

Physical Benefits

- Improves flexibility and muscular strength
- Enhances cardiovascular efficiency
- Improves respiratory capacity
- Improves posture and endurance
- Enhances circulation

Psychological Benefits

- Reduces stress and anxiety
- Improves concentration and memory
- Enhances emotional stability
- Promotes relaxation and mental calmness
- Improves sleep quality

Physiological Benefits

- Improves autonomic balance
- Reduces sympathetic overactivity
- Enhances parasympathetic activity
- Improves neuroendocrine regulation
- Improves respiratory efficiency

LIMITATIONS OF CURRENT EVIDENCE

Most available studies evaluating the effects of Surya Namaskar and mantra chanting on stress are observational or based on small sample sizes. Variations in study design, duration of intervention, stress assessment tools, and participant characteristics may affect interpretation of results.

Further randomized controlled trials with objective biomarkers such as cortisol levels, heart rate variability, and validated stress assessment scales are required for stronger scientific validation.

FUTURE SCOPE

Future research should evaluate the comparative effectiveness of Surya Namaskar practiced with and without mantra chanting in different Prakruti types and age groups.

Clinical studies assessing autonomic balance, neuroendocrine markers, psychological scales, and quality of life parameters may help establish stronger scientific evidence regarding the role of Surya Namaskar in stress modulation.

Integration of Ayurvedic assessment tools with modern physiological parameters may further strengthen interdisciplinary understanding of stress management.

CONCLUSION

Stress among college students has become a major psycho-physiological challenge affecting physical health, emotional stability, concentration, academic performance, and quality of life.

Ayurveda and yoga provide a holistic, safe, economical, and non-pharmacological approach for stress modulation. Surya Namaskar positively influences autonomic balance, respiratory efficiency, cardiovascular function, concentration, emotional stability, neuroendocrine regulation, and psycho-physiological health.

Addition of mantra chanting further enhances mindfulness, parasympathetic dominance, emotional calmness, concentration, Satva predominance, and psycho-spiritual harmony. Mantra acts through sound vibration, autonomic regulation, neuroendocrine modulation, respiratory synchronization, and stabilization of Manas and Manovaha Srotas.

Sharir Prakruti plays an important role in determining individual susceptibility and response to stress. Understanding stress according to Ayurvedic principles may help develop personalized preventive and therapeutic strategies.

Further observational and clinical studies are required for scientific validation of the role of Surya Namaskar with and without mantra in stress modulation.

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