



Review Article

**CRITIQUE ON THE CONCEPT OF PSYCHONEUROIMMUNOLOGY (PNI) IN AYURVEDA AND YOGA
w.s.r. TO COVID-19 PANDEMIC**

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ABSTRACT

The COVID-19 outbreak has prompted significant levels of psychological distress and critical effect on emotional wellness as well as challenged health care systems across the globe. Such distress is accompanied with alterations in immune function including expanded danger of viral respiratory tract infections. It has shaken the entire world with this worldwide crisis. The panic situation created by the disease along with the unfamiliar way of conduct imposed several psychological impacts on human life. Many can't cope up with the situation on their own and are in need of an intervention such as Psychological First Aid. Fear, anxiety, future concerns, interpersonal relationships issues, behavioral issues, domestic abuses, separation anxiety are a few among the psychological issues reported. It is basic to comprehend that these depend on a more profound comprehension of how choice less mindfulness coordinates the neurological, immune and metabolic frameworks with psychological processes to work overall. In this review article, an attempt has been made to critically enlighten the ancient and recent development of the Psychoneuroimmunology (PNI) in Ayurveda and *Yoga* in concern with Covid-19 Pandemic.

KEYWORDS: Psychoneuroimmunology (PNI), Ayurveda, *Yoga*, Covid-19.

INTRODUCTION

There has been an outbreak of the COVID-19 world-wide. The outbreak started in late 2019 and developed into a global pandemic by March 2020. With over 41, 570, 883 cases and 1,134,940 deaths reported to date October 21st, 2020. The COVID-19 pandemic is a global health crisis with an actual or potential impact on citizens of all nations. By Comparing to the past outbreaks, this is highly contagious. The only way to get over the crisis is to break the transmission by avoiding strict personal contact, by means of social distancing along with maintaining personal and respiratory hygiene. The COVID-19 pandemic has disrupted or halted critical mental health services in 93% of countries worldwide while the demand for mental health is increasing^[1]. This world today has a lot more psychological problem and every human being who is running for survival is facing some kind of mental or psychological disturbances. Immunity of the body and health of the psyche are being affected very commonly in this pandemic. In spite of the great advancement in the science of psychiatry and neurology for decades, the problems with the management of certain mental problems have remained unsolved. In addition to this, adverse effects of antipsychotic and anti-neuropathic

medication are creating a considerable amount of discomfort to the patient. At this juncture, the better solution for these problems is possible through Ayurveda and *Yoga*.

Impact of the Covid-19 Pandemic on Psychoneurological Health

According to the new WHO survey conducted from June to August 2020, the provision of mental, neurological and substance use services has grossly changed due to COVID-19^[1]. Fear, worry and stress are normal responses to perceive at times when we are faced with uncertainty or the unknown. So it is normal and understandable that people are experiencing fear in the context of the COVID-19. Faced with new realities of working from home, temporary unemployment, home-schooling of children, and lack of physical contact with other family members, friends and colleagues, it is important that we look after our mental as well as our physical health. Bereavement, isolation, loss of income and fear are triggering mental health conditions or exacerbating existing ones. Many people may be facing increased levels of alcohol and drug use, insomnia and anxiety. Meanwhile, COVID-19 itself can lead to neurological and mental

complications such as delirium, agitation, changes in sleep, appetite, energy level, concentration, self-esteem, stroke etc. This pandemic of COVID has been bolted each and every person where they were and step by step the number of patients are getting climbed which have given ascended to sentiment of dread of getting infected, quarantined, loose positions and so forth. People with pre-existing mental and neurological conditions are more vulnerable to SARS-CoV-2 infection. They may stand a higher risk of severe outcomes and even death. The physical impairments would potentially have psychiatric manifestations during the course of a disease, making patients experience a wide range of psychological as well as neurological condition^[2].

The health issues and their consequences change according to the age factor. The progressive system of their needs are being shifted in the phases of life. While thinking about kids, they are a powerless gathering and consistently face different infections. Consequently they are confined to their opportunity in shut doors, in the holidays particularly. Choices with respect to their exams and returning of schools are constantly fluctuating and their screen time unquestionably expanded and is much of the time hearing the report about the status of the illness. This makes dread furthermore and anxiety among them. Additionally some may have opportunities to create fixations for example consistently washing hands, hesitant to have food because of the trepidation of getting infected.

In the middle age group, they have expanded future concerns coming about because of the occupation weaknesses and nearly resultant money related issues. As they are totally bolted down in their homes, many created change issues as it is very new for their situation. Their every day schedule such as food timings, every day works out, dozing hours and so on are changed intensely. Living endlessly from home in such circumstances has made partition uneasiness among them and furthermore relational relationship issues thusly. There is too possibility of withdrawal manifestations from the inaccessibility of psychoactive medications prompting expanded homegrown maltreatments as well as viciousness against ladies.

The mature age, another weak group has likewise their own mental issues. Many have expanded dread of death or might be over anxious about getting the sickness. Separation tension may likewise result from separation of their youngsters, coming about because of sudden lockdown. Those with other persistent illnesses get the opportunities of getting exacerbated because of stress, non accessibility of maids and furthermore rest related

issues. Any winning mental condition may worsen due to the resultant pressure, adjustment in drug and furthermore from social disconnection.

Thinking about the different societies in the general public, all are influenced in a practically equivalent way. Revering territories are the spots of mass social affairs and are limited to the lockdown; consequently it influences all the religions. Celebrations are limited in houses prompting great kinds of disappointment in the network. Thinking about the sexes, all are similarly influenced yet on the off chance that of misuse, ladies are more inclined to get influenced. According to WHO, one among the three ladies worldwide have experienced physical and additionally sexual savagery by any culprit in their life times and these will in general upgrade during such kinds of crisis circumstances, adversely influencing the mental status in ladies in a critical way³.

Review on Psychoneuroimmunology

Psychoneuroimmunology is based on the evidence of an intimate link between the nervous, psychological and immune systems and explains the mechanisms by which stress and emotional disorders can modulate the immune response to infections⁴. It is pertinent to emphasize here that the role of the emotional and psychological factors over the proper functioning of the immune system has been very clearly appreciated by Ayurveda, which is now being increasingly recognized by modern science based on the evidence of various experimental and clinical studies. In fact, a new branch of medical sciences known as "Psychoneuroimmunology" is fastly developing which studies the interrelationship of psychological factors, nervous system and immune system. *Vyadhikshamatva* (immunity) is not of the same order constitutions i.e., it varies with individuals. It also depends upon nutritional, environmental and individual factors – both physical and mental⁵. The idea is that if the physical body is stressed from either external or internal stimuli, the nervous system will be triggered into an autonomic response that will signal a specific immune response to activate. In turn the person's emotional and mental well-being will be compromised from the physiological responses occurring in the body. This creates a potential negative feedback loop that may initiate an unhealthy cycle of reaction between the body and mind⁶. The immune system plays a critical role in our response against infectious disease. The immune system is the body's multi-level defense network against potentially harmful bacteria, viruses and other organisms. The role of psychosocial factors in increasing susceptibility to viral respiratory tract infection is well documented⁷.

With the discovery of cytokines in the brain came the understanding that the immune system could influence the brain in reverse. For example we get “sick” because of a microorganism, such as the common cold, the symptoms of malaise, fatigue, lack of energy, and low appetite are part of this immune to brain loop. Since the body is fighting a pathogen it sends messages to the brain to slow down by causing lethargy and other symptoms that elicit a “sickness behavior,” and this response is understood to be triggered by cytokines produced by the immune system^[8].

Foundation of Immunity in Ayurveda

Ayurveda is an Indian traditional system of medicine over 3000 years prior. The *Charaka Samhita* referenced about pandemic etiopathogenesis and management as well as defines immunity as the ability for preventing and arresting the progression of disease for maintaining homeostasis. The Ayurveda pays the bigger accentuation on the building quality of psyche and body to adapt to different stressors, including infectious diseases. Similar to Innate and Acquired immunity, the Ayurveda's concept of immunity (*Bala* or strength) is classified as natural (*Sahaja*), chronobiologic (*Kalaja*), and acquired (*Yuktikrut*)^[9]. Acharya *Vaghbhatta* explains that *Ojas* can be diminished due to the excessive anger, worry, hunger, fear, grief, and physical exertion. All of these factors place stress on the body and trigger a neural immune response by the release of cytokines. *Vaghbhatta* then describes that the excessive of these factors manifest into specific symptoms: anxiety, worry, constant weakness, sensory organ disorder, loss of complexion, unstable mind, depression, dryness and emaciation^[10]. According to the *Charaka Samhita*, Ayurveda's core text, without *Ojas* an individual would not be able to survive^[11].

Psychoneuroimmunology and Ayurveda

Ayurveda, so called an eternal science, the science of life deals with spiritual, psychological and physical well being of the individual. Acharya Charaka states that the purpose of Ayurveda is to “protect the health of the healthy and to alleviate disorders of the disease^[12]. In Ayurveda, for psychoneurological diseases, several treatment options are available for enhancing immunity against respiratory illnesses; these include certain immunomodulators (known as *Rasayana*), local and systemic interventions^[13]. This includes

Satvavajaya Chikitsa (Mental Control Therapy)

Well explained modality of psychotherapy mentioned in Ayurveda i.e., *Satvavajaya chikitsa* can be adopted in such situations. *Jnana* (knowledge of self), *Vijnana* (scientific reasoning), *Dhairya*

(determination or patience), *Smrithi* (application of recollections or memory) and *Samadhi* (by attaining a stable state of mind) are the steps of this management which are applicable in any psychological issues, including that resulting from COVID as well. Psychologically ill individuals can be treated with *Sattvavajaya chikitsa* in a proper way. A trained professional in *Satvavajaya* is equipped for conveying this method in such individuals in a very compelling way.^[14]

Sadvritta Palan (Ideal Path of Good Conduct in Life)

In Ayurveda, for prevention of *Manas rog* (psychological diseases), the best way is to increase the *Satva* and to increase the *Satva* described comprehensive description of “*Sadvritta palan*”. *Sad* means good and *Vritta* means regimen. This is the code of conduct for keeping good or balanced condition of body and mind. Acharya Charak explained some rules of good conduct and said that exercise of the ideal conduct leads to restraining of senses and mind also gets controlled in sequence^[15]. *Sadvritta* (personal and social code of conduct) as per mentioned in Ayurveda will help to gain a long, happy, peaceful and healthy life. The codes of conduct can be divided as - Ethical or *Vyavaharika sadvritta*, Social or *Samajika sadvritta*, Mental or *Manasika sadvritta*, Moral or *Dharmika sadvritta*, and Physical or *Sharirika sadvritta*^[16].

Acharya Rasayana

Acharya-Mental attitude, *Rasayana*- Rejuvenating therapy. This told in the classics has direct influence in maintaining the mental and spiritual well being^[17].
 1. Truthfulness 2. Letting go of anger 3. Not over indulgent with alcohol or sexual activity 4. Non-violence 5. Calm 6. Sweet Spoken 7. *Jappa*- *Mantra* meditation 8. Cleanliness- Habitually cutting hair, nails, and bathing daily 9. Perseverant- unwavering in the face of difficulty 10. Charitable- Giving to those less fortunate and in need 11. Regular worship and offerings to teachers, elders, gods, cows, and priests 12. Devoted to love and compassion 13. Balanced in wakefulness and sleep 14. *Sattvic* diet with regular intake of milk and ghee 15. Taking in consideration time, place, and circumstance when assessing all situations 16. Acting well-behaved 17. Simple minded and free from ego 18. Engaging the senses in spiritual activities 19. Keeping the company of “elders” or saints - those who have wisdom 20. Surrounding oneself with uplifting and positive company 21. Practicing optimism 22. Self-control 23. Devotion to studying holy scriptures^[18]. The *Acharya Rasayana* guide laid out in *Charaka Samhita* encourages a moral path of integrity which directly relates to an individual's state of health. The nervous system

becomes calm, avoiding excessive stress on our system, which simultaneously pacifies our endocrine system from releasing stress hormones. This information is picked up deep in the cells of our immune system^[19]. Along with that on account of following this path, immunity of the person (*Ojas*) can also be improved gradually^[20].

Yuktivyapashraya Chikitsa

Ayurveda has described *Yukti vyapashraya chikitsa* (rational use of drugs, diet, and activities) for the management of psychoneurological disease. It includes *Samshodhana* (body cleansing procedures like *Panchakarma*) and *Samshamana* (pacifying *Doshas* by internal medicines, diet, and/or activities). Among the glimpses of such studies the pertinent ones seem to be the following

- Kobayama *et al.* (2005) reported their in vitro studies in British Journal of Pharmacology demonstrating the efficacy of Withanolide- A isolated from *Rasayana* drug *Ashvagandha* (*Withania Somnifera* dunal.) as a neuro-regenerative agent. Neurons cultured with Withanolide- A showed that the dendrites of the neurons became elongated and the synapses got reconstructed^[21]. Archana and Namasivayam (1999) showed significant anti-stress effects of the same^[22]. It is suggested that neuro-nutrient effect, neuro-protective impact, anti-stress effect and the immunomodulator effects are interlinked and are likely to be a continuum.
- Jana, U., *et al.* reported their clinical study on *Mandukaparni* (*Centella asiatica*) (CA) on Generalised Anxiety Disorder revealed that administration of *C. asiatica* regularly for two months reduced stress, attenuated anxiety, negated depression and enhanced adjustment and attention in patients without any side effects like vertigo, nausea, and dizziness or mental weakness. These observations clearly indicated that CA has potential action in the regulation of hypothalamo-pituitary-adrenocortical axis (HPA axis) especially, during stress related disorders. It appears that *C. asiatica* may be a safer alternative to Benzodiazepines for the therapy of stress related clinical disorders^[23].
- Anup jain *et al.* has reported 14 days trial of *Jatamansi Siddha Taila Shirodhara* on 60 patients of Anxiety neurosis proved to be effective which act by strengthening *Manovaha strotasa* (Psychological system)^[24].
- *Shirodhara* may also have Alpha Adrenergic blocking effect and can thus block certain actions of adrenaline and noradrenaline. It may also act on the adrenergic neuron probably produce their

effects by modifying the synthesis storage and uptake mechanisms of nor-adrenaline while being monitored for numerous physiologic, biochemical, immunologic and psychometric parameters resulted in decreased anxiety and promoted ASC (Altered State of Consciousness). A correlation with Natural Killer Cell (NK cell) activity and anxiolytic effect within the *Shirodhara* group was also observed. The ultimate aim of the *Shirodhara* is to restore the equilibrium of *Sharira* and *Manasika doshas* through the psycho-somatic axis, which in turn facilitates '*Manoprasannatah*' or tranquillity of mind, a positive sign of healthy state of the body^[25].

• **Yoga**

Yoga based interventions may prove to be an attractive option for the treatment of depression. Even a short trial of 2 months led to decreased depression^[26]. The decreased depression may relate to the change in brain waves and the decreased cortisol levels noted during Yoga postures. For example, in one study, weekly Yoga sessions led to increased alpha waves (sign of increased relaxation) and decreased cortisol. The reduction in cortisol, in turn, may contribute to positive results in enhanced immune function^[27].

- After 6 months of yoga practice, the Yoga group versus the standard control group had a significantly shorter latency to sleep as well as a significant increase in the total number of sleep hours and in the feeling of being rested in the morning^[28].
- According to a study published by The North American Journal of Medical Science, having a regular practice of mantra meditation, yoga, and *Pranayama* were linked to positively influencing immunity and joint disorders while also improving cognition and respiration^[29].

DISCUSSION

There has been a lot of research to evaluate the therapeutic value of a range in Ayurveda specially for their psychoneuroimmunological effect showing encouraging results. When the endocrine, nervous, skeletal, muscular, hematopoietic, and digestive systems function optimally then *Ojas* and healthy immunity is maintained. It is the primary objective of the prescriptions and prohibitions described in Ayurveda for the preservation and promotion of positive health and prevention as well as cure of diseases. Brain, body and soul are autonomous subjects for comprehension. Truth be told, these are reliant and influence each other's working. The advanced idea of psychoneuroimmunology likewise works upon the equivalent standards. It is

additionally a fact that with the assistance of biochemistry, contemporary science has itemized the theme with data about neurotransmitters extricating information about related proteins and so on. There are progressed restorative modalities and conventions as a component of the more extensive conversation of Ayurveda. It is basic to comprehend that these depend on a more profound comprehension of how choice less mindfulness incorporates the neurological and immune frameworks with psychological functions to work all in all. Psycho-neuro-immunomodulators can be considered now as one of the most potent tools in the management of health and disease by Ayurveda and Yoga. In fact the role of this in Ayurveda and yoga is yet to be fully appreciated or perceived as our understanding of the immune system is changing at a rapid pace. The more recent understanding of neuro-endocrine-immune axis or the influence of exercise, circadian rhythms, seasonal variations, different psychological states on immune system are unfolding many such issues which are bringing the modern concept closer to Ayurvedic principles of *Vyadhiksamatva*, *Ojas* and *Bala*.

CONCLUSION

In this Covid-19 Pandemic, a panic situation created by the disease along with the unfamiliar way of conduct imposed several psychoneurological impacts on human life. Modern medicines are good for short term treatment but having many untoward effects and having their own limitations. Ayurveda and Yoga if practiced in daily life has both preventive as well as curative effect. In fact Psychoneuro-immunological effects of certain Ayurveda and Yogic procedures are of greater relevance in today's scenario. The further improvement in the traditional clinical work of Psychoneuroimmunological perspective from Ayurveda and Yoga definitely prove beneficial by preventive and therapeutic modalities during Covid-19 pandemic and encourage a more synergistic connection among conventional and modern medication.

REFERENCES

1. <https://who.int/health-topic/coronavirus>.
2. B. Dash, Fundamentals of Ayurveda Medicine, Sri Satguru. Publications, Delhi, India, 2005
3. World Health Organization. COVID-19 and violence against women. Sexual and reproductive health [Internet]. 2020 [2020 April 7] <https://www.who.int/reproductive-health/publications/vaw-covid-19/en>
4. Kim, S.W., Su, K.P., 2020. Using psychoneuroimmunity against COVID-19. Brain, Behavior Immun. (in press). doi: 10.1016/j.bbi.2020.03.025.

5. Dr. J.S. Tripathi et.al: 'The Concept and Practice of Immunomodulation in Ayurveda and the Role of Rasayanas as Immunomodulators': Ancient Science of Life: Vol. No. XIX (1&2) July, August, September, October 99: page no.1).
6. Oregon Health & Science University, OHSU Staff, Psychoneuroimmunology Research Lab. <https://www.ohsu.edu/xd/education/schools/school-of-medicine/departments/clinical-departments/psychiatry/research/psychoneuroimmunology/>
7. Zawada, K., Bratek, A., Krysta, K., 2015. Psychological distress and social factors in patients with asthma and chronic obstructive lung disease. Psychiatr. Danub. 27 (Suppl.1), S462-S464.
8. Robert Dantzer, "Cytokine, Sickness Behavior, and Depression," Neurologic Clinics, 2006,24(3): p.441-460. <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC2909644/>
9. Acharya, Y. (Ed.), 1992. Charaka Samhita. Chaukhamba Surbharati, Varanasi, IndiaGoogle Scholar.
10. R.Vidyanath, Astanga Hrdaya (Varanasi: Chaukhamba Surbharati Prakashan, 2013). Book 1, Chapter 11, Verse 39, p. 196.
11. P.V.Sharma, Charaka Samhita, (Varanasi: Chaukhambha Orientalia, 2014) Volume 1, Section 1, Chapter 30, verse 9-11, p. 237.
12. P.V.Sharma, Charaka Samhita, (Varanasi: Chaukhambha Orientalia, 2014) Volume 1, Section 1, Chapter 30, Verse 26, p.240.
13. Balasubramani, S.P., Venkatasubramanian, P., Kukkupuni, S.K., et al., 2011. Plant-based Rasayana drugs from Ayurveda. Chin. J. Integr. Med. 17, 88-94.
14. Charaka Samhitha, Sutrasthana, Vaidyabagavan das, (trans.) (eng.) 3.Varanasi: Chaukhambha Orientalia; vol 1; 2011; p-43.
15. Agnivesha: Charaka samhita, revised by charaka and Dridhabal, with commentary of chakrapanidatta, edited by jadavaji trikamaji acharya, chaukhambha Sanskrit sansthana, Varanasi, 5th Edi.2001. sutrasthan. 9/3, page no.61.
16. Thorat Vidhyashree J., Role of Code of Conducts of Life (Sadvritta) in Prevention of Crimes, Int. J. Ayu. Alt. Med., 2015; 3(4):194-198
17. Agnivesha: Charaka samhita, revised by Charaka and Dridhabal, with commentary of Chakrapanidatta, edited by Jadavaji trikamaji acharya, chikitsasthan 1/30-35. Chaukhambha Sanskrit sansthana, Varanasi, 5th Edi.2001.

18. P.V.Sharma, Charaka Samhita, (Varanasi: Chaukhambha Orientalia, 2014) Volume 6. Chapter 1, Verse 30-35, pg. 32
19. Samantha Carey: AHP Level 2:January 2017 Achara Rasayana & Psychoneuroimmunology: page. No 10-11.
20. Agnivesha: Charaka samhita, revised by charaka and Dridhabal, with commentary of Chakrapanidatta, edited by Jadavaji trikamaji acharya, sutra sthana 8/18 chaukhambha Sanskrit sansthana, Varanasi, 5th Edi.2001.
21. Kobayama, T. et al. Nutritic regeneration and synaptic reconstruction induced by Withanolide-A. British J.Pharmacol.144/7:961-971,2005.
22. Archana, R. and Namshivayam, A. Antistress effect of Withania somnifera Dunal, J. Ethnopharmacology. 64:91-93, 1999.
23. Jana, U., et al. "A Clinical Study on the Management of Generalized Anxiety Disorder with Centella asiatica." Nepal Med Coll J 12.1 (2010): 8-11.
24. Anup Jain, Surendra M. Vedpathak, Ashok Kumar Singh, Arun Gupta, Umesh Sapra. Clinical Evaluation Of Jatamansi Siddha Taila Shiro-Dhara On Anxiety-Neurosis, J Of Ayurveda And Hol Med (JAHM).2016;4(2):16-25.
25. Dr.Vaidehi V.Raole: Therapeutic Efficacy of Shirodhara In Psychosomatic Disor-des. International Ayurvedic medical Journal {online} 2016 {cited 2016 July} Available from: http://www.iamj.in/posts/images/upload/3149_3152.pdf.
26. Uebelacker LA, Tremont G, Epstein-Lubow G, Gaudiano BA, Gillette T, Kalibatseva Z, et al. Open trial of Vinyasa yoga for persistently depressed individuals: evidence of feasibility and acceptability. Behav Modif 2010 May;34(3): 247e64.
27. Kamei T, Toriumi Y, Kimura H, Ohno S, Kumano H, Kimura K. Decrease in serum cortisol during yoga exercise is correlated with alpha wave activation. Percept Mot Skills 2000;90(3 Pt 1):1027e32.
28. Manjunath NK, Telles S. Influence of Yoga and Ayurveda on self rated sleep in a geriatric population. Indian J Med Res 2005;121:683e90.
29. PA Balaji, Smitha R Varne, and Syed Sadat Ali, Physiological Effects of Yogic Practices and Transcendental Meditation in Health and Disease, The North American Journal of Medical Science, October 2012, 4(10): p.442-448 <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3482773/>.

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