

The Biology and Philosophy of Stress : An Integrative Review of Contemporary Perspectives Through Unani Conceptualization

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Abstract

Stress has become a pervasive aspect of daily life, particularly in the post-COVID-19 era. A 2024 online survey of 1,479 adults in India reported that approximately 85% of individuals experienced moderate stress, while 10% had mild stress and 5% severe stress. Historically, stress research began in the early 19th century with Cannon's description of physiological responses to nociceptive stimuli and the concept of homeostasis. Selye later defined stress as the non-specific response of the body to any demand. In Unani medicine, stress is understood as an imbalance of humors (Akhlat), particularly Safra and Sauda, resulting from internal and external factors. Pathophysiologically, stress activates the hypothalamic–pituitary–adrenal (HPA) axis and sympathetic-adreno-medullary system, increasing cortisol and catecholamines, which impact metabolism, immunity, and psychological state. Unani concepts emphasize the influence of environmental factors (Hawa), diet (Makool wa Mashroob), bodily and mental activity (Harkat wa Sukoon), sleep patterns (Naum wa Yaqza), and retention/evacuation (Ihtebaas wa Istifragh) on Mizaj (temperament). Excessive stress disrupts physiological and mental equilibrium, manifesting as anxiety, insomnia, fatigue, and cognitive disturbances. Integrating modern and Unani perspectives highlights the importance of lifestyle, diet, sleep, and environmental management for stress prevention and health maintenance.

Keywords: Stress, Unani medicine, Humoral imbalance, Mizaj, Safra, Sauda, HPA axis, Cortisol, Anxiety, Insomnia, Sleep, Diet, Environmental factors, Neuroendocrine response, Post-COVID stress, Psychological and physical stressors

Prevalence

A 2024 online survey of 1,479 adults in India found that stress is a common part of daily life for many people after the COVID-19 pandemic. Using the Perceived Stress Scale (PSS), the study showed that most people were not completely stress-free. Around 1 in 10 people experienced mild stress, while a

large majority — nearly 85% — lived with moderate levels of stress. A smaller but important group, about 1 in 20 people, suffered from severe stress, showing that a significant number of individuals were deeply affected in their day-to-day lives.[1]

Introduction

The scientific study of stress began in the early 19th century when physiologist Walter Bradford Cannon described the body’s responses to nociceptive stimuli such as hunger, cold, exercise, and strong emotions. He observed that bodily functions essential for maintaining energy reserves are immediately mobilized or temporarily interrupted during stress to enable effective “fight or flight” responses. Cannon later coined the term homeostasis, emphasizing the maintenance of internal stability despite external changes. Hans Selye further defined stress as a “non-specific response of the body to any demand placed upon it,” laying the foundation for modern stress research.

In Unani medicine, stress is conceptualized as an imbalance in the humors (Akhlat), resulting from excessive or abnormal combustion of certain humors (Ihteraaq of Aklaat). Different combinations of humor imbalance, such as Sauda-e-Gair Tabayya, Sauda Belgamiya, Sauda Safrawiya, and Sauda Damuwiya, can manifest as physical and psychological disturbances, including anxiety, insomnia, and fatigue (Al-Sheikh Al-Rais Abu Ali Sina, 1993).

Blood (Dam)	Hot	wet
Yellow bile (Safra)	Hot	dry
Phlegm(Belgham)	Cold	wet
Black bile	Cold	dry

Stress affects multiple physiological systems, triggering neuroendocrine responses through activation of the sympathetic-adreno-medullary (SAM) system and hypothalamic–pituitary–adrenal (HPA) axis, resulting in increased cortisol and catecholamines. Unani medicine emphasizes that stress also disrupts the Mizaj (temperament), influenced by environmental, dietary, lifestyle, and psychological factors, demonstrating a holistic understanding of stress that parallels modern physiological insights.

History of stress research:

In the beginning of 19th century physiologist "Walter bradfort cannon after series of investigation described "bodily changes occurring in conjunction with nociceptive events; hunger, cold, exercise and strong emotions cannon noted that functions that establish and support the body energy reserves at rest, in face of a stressful situation where immediately intensified or completely interrupted inorder to mobilize great energy. This mobilization allows an improvement of potential escape and attack/defense response."Later, he coined the term "homeostasis".He wrote "the blood and other fluids surrounding cells constitute the internal environment with which occur direct exchange of exchange of each cell and this must always be kept with parameters suitable for cell function regardless of changes that may occur in the external environment.

"Selye defined stress from a biological point of view as a "non specific response of the body to any demand made up on it.[2]

" According to unani medicine stress is a result of oxidation of particular humors (ihteraaq of aklaat). All changed varieties of humour are collectively referred to as "Sauda e gair tabayya which has a barid

yabis (cold and dry) mizaj [3]

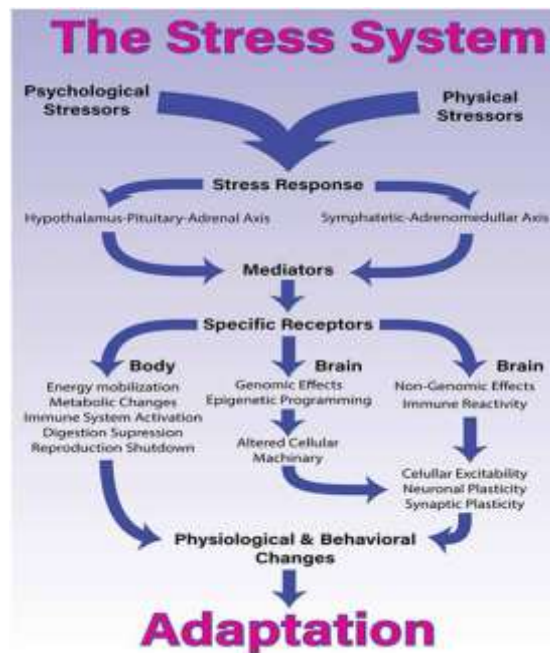
Interaaq of belgm resulted in production of Aberrant humour “Sauda belgamiya. While interaaq of safra and sauda and dam result in sauda safrawiya and Sauda saudawiya , Sauda damuwiya (Al sheik Al Rais Abo Ali sina 1993).[3]

Chronic stress lead to various health issues including cardiovascular disease,diabetes,depression and anxiety.[4]

Oxidative stress can be seen as molecular level of expression of ihteraaq,further various components of ihteraaq may be used to hypothesize molecular subtypes of oxidative stress and propose corresponding specific intervention

In unani medicine, a deteriorating phenomenon that alters the normal humoral makeup and is implicated in all the ailments has been as described as Ihteraq (unwanted combustion).production of Hararat e ghareeba (unnatural heat) results in ihteraq (oxidation) of humours.[5]

Pathophysiology



A stress response is mediated through complex interplay of nervous ,endocrine,immune mechanism activating the sympathetic-adreno-medullary (SAM) axis, the hypothalamic-pituitary-adrenal (HPA) axis, and the immune system. The stress response is adaptive to prepare the body to handle the challenges presented by an internal or external environmental challenge, such as stressors.[6] Stress triggers a series of neuroendocrine responses that involve activation of the sympathetic adreno–medullary (SAM) system and the hypothalamic–pituitary–adrenal (HPA) axis

When a stressor is perceived, the hypothalamus releases corticotropin-releasing hormone (CRH), which stimulates the anterior pituitary gland to release adrenocorticotrophic hormone (ACTH). ACTH then acts on the adrenal cortex, resulting in the secretion of cortisol.[2]

Cortisol helps in Increase gluconeogenesis (blood glucose levels),suppresses immune and inflammatory responses ,alters lipid and protein metabolism.

Stress in Unani medicine is classified as a disturbance in the Mizaj (temperament) of an individual. The Mizaj, influenced by genetic, environmental, and dietary factors, determines a person's physical and

mental resilience. Excessive stress disturbs the Mizaj, particularly leading to an imbalance in Safra and Sauda, resulting in symptoms like anxiety, insomnia, and fatigue. From a physiological perspective, stress increases the release of Safra, which corresponds to an over production of catecholamines like adrenaline and noradrenaline. This leads to a heightened sympathetic response, akin to the “fight or flight” reaction described in modern medicine [4]

Psychological stressors: The stress stems from asbaabe gair zarooriya cognitive and emotional factors: Khauf (fear), Ghazab (anger), Huzn (sadness), Anxiety/worry (fikir/Andesha), Shock (Ta’ajjuh), Excessive joy (Farah)

Physical stressors :-

Physiological stress refers to the body's response to internal or external stressors that disrupt homeostasis. Asbab e sitte zarooriya (six essential factors)

Both factors like asbaab e sitte zarooriya and gair zarooriya weaken the body's innate heat, suppress metabolism and immunity promote belghm dominance (increased mucus production), fluid retention, sluggish circulation.

Four humors like blood (dam), bile (safra), melancholic (sauda), phelgm (belghm) interact with the organs and in their appropriate proportion, perform the physiology of the body with the help of organs. When this proportion is disturbed it manifests various pathologies.

These pathologies are predisposed by the six essential factors of life:

1. Hawa (Environment)
2. Makool wa Mashroob (Food and drinks)
3. Harkat wa Sukoon Badani (Movement and rest of body)
4. Harkat wa Sukoon Nafsani (Psychological factors)
5. Naum wa Yaqza (Sleep and wakefulness)
6. Ihtibas wa Istifragh (Retention and Evacuation)

Hawa – Environmental Factors:

As described in Unani literature, the effect of climate occurs on the core temperature or vital heat of the body.

- When the quality, temperature, or purity of air changes it can disturb the Mizaj (temperament) and cause Soo-e-Mizaj /Izteraab-e-Nafs.
- Ali Ibn Abbas Majusi writes in his book Kamilus Sana that “All changes in our body which take place are influenced by Infelaat-e-Nafsaniyya (emotional reactions / psychological excitations).

Recent experimental evidence has shown that particulate matter and ozone, two common pollutants with differing characteristics and reactivity, can activate the HPA (Hypothalamic–Pituitary–Adrenal axis) and elevate glucocorticoid stress hormones (cortisol in humans, corticosterone in rodents) as part of a neuroendocrine stress response. The brain is highly sensitive to stress; stress hormones affect cognition and mental health. Chronic stress can produce profound biochemical and structural changes in the brain. Chronic activation and dysfunction of HPA axis also increases the burden on the physiological stress response system. [7]

Brain is the important vital organ of Quwat-e-Nafsaniyya. Abnormal Infe’al Nafsani leads to excess worry, fear etc., and body can convert into disease condition. [8]

Ibn Sina (Avicenna) wrote that “Prolonged exposure to Hawa-e-barid and Ratab) leads to weakness of Quwat-e-Nafsaniyya and causes Izteraab-e-Nafsani (mental disturbances) because of environmental stre-

ss.”

Zakariya Razi (Rhazes) ihteraaq e rooh (oxidation of vital spirits) and dryness of brain temperament, thereby impairing psychological resilience.[9]

Studies found relations to physical health such as cardiovascular disorders, lung cancer, chronic bronchitis, headaches, or asthmatic attacks. Besides these direct impacts of pollution, there are also indirect effects such as irritation, annoyance, displeasure, and less physical outdoor activities [11]

Noxious (Nafs) Yaabis Hawa provokes Safra causing dryness in brain and nerves leading to stress, anxiety, insomnia. Subtle gaseous & even chemical/biological pollutants alter the temperament of the brain [10]. Bad air exposure leads to khilal-e-hazima (digestive disturbances), Hawas (senses) become impaired and the body's internal balance is disturbed.

Makool wa Mashroob (Food and Drinks)

Most diseases arise from improper selection of food and faulty indigestion. Overeating harms Quwat-e-Hazima (digestive power) leading to production of Akhlat-e-Sauda. Diet influences Nafsani (mental) states. Excessive Haad /mizaj (hot) food provokes Safra, causing irritability, restlessness, insomnia. Excessive Barid wa Ratab (cold & moist) foods increase belgm, leading to lethargy, excessive sleep, laziness (Nuqs).[12]

Acute stress activates adaptive responses, but prolonged stress leads to “wear-and-tear” (allostatic load) of the regulatory systems, resulting in biological alterations that weaken stress-related adaptive processes and increase disease susceptibility. Regular and binge use of addictive or oxidative substances may serve as pharmacological stressors.[14]

Zakariya Razi in his book mentioned stale, putrefied, or poor-quality food produces Sauda, melancholia, anxiety, and waswasa. Irregular eating habits weaken digestion, create Akhlat imbalance, and change brain temperament.

In modern physiology chronic stress induces activation of the neuroendocrine HPA axis increases glucocorticoid synthesis and glucose availability to fuel metabolic demand and affect physiological & behavioural stress responses. They regulate the accumulation & storage of body fat, appetite, food intake, and body weight gain.[14] Avicenna stated in his famous treatise ‘AL QANOON’ that dietetics and is the one of the significant medical subjects and he further alleged that the stomach is the house of disease and the diet is the head of healing[15]

An animal trial published in an International Peer-Reviewed Journal stated that continuous access to snacks from weaning onwards in female rats causes: Weight gain, Insulin insensitivity, Sustained leptin resistance in adulthood. Another study shows snacking during the day seemed to promote signs of metabolic syndrome in adulthood, even when excess caloric intake was not observed.[15]

Avicenna stated in Canon that if a person is obese then he should have his food 3 times in 2 days: One day he has to eat only lunch and on the second day breakfast and dinner. Quantity, type, quality, and time of food depend on the temperament of the person or the disease.

Harkat-e-Sukoon Badani & Nafsani (Equilibrium of movement & rest of body & mind) ;

Excess movement leads to decrease in Quwwat leads to yaboosat (dryness) & exhaustion leading to weakness of dimagh. Excessive rest leads to accumulation of mavaad e fasida and fluids leads to poor circulation, heaviness, dullness of minds laziness (derangement of mind) leading to anxiety/low mood.

Emotional movement (excessive mental movement) like constant thinking (emotional turmoil), overheating of Arwah(rooh) leads to disturbance of brain temperament leading to, stress, anxiety, melancholia.[17]

All psychological conditions are followed by either inward or outward movement of pneuma (Rooh) which may be gradual/sudden.[18] A study shown that emotion regulation has a significant association with mental health,[19]

- A study in the US was conducted on overall 3836 adolescents (1784 girls, 41%); mean (SD) age = 12.7 (0.5) years) indicated that 1 hr increase in social media use was associated with 0.64 units ↑ in severity of depression symptoms.
- Working >55 hr/week is a serious health hazard (WHO director) → higher risk of stroke (35%); 17% (CAD)

Ihtebaas wa istefrag retention and evacuation:

Excessive evacuation deprives the faculties and produces weakness and mental fatigue. Over purging (Kasrat-e-Ishqal) can cause change in temperament(sue e mizaj) leading to (anxiety), irritability, and neurasthenia.

Retention is retention of waste products corrupts the temperament and produces grief, sadness, depression. Samarqandi in kitab Ul Asbab Wal Alamat, describes how Qabz, i.e., faecal retention if prevented menstruation leads to sadness (Hazn), Anger, Insomnia & headache; all signs of mental health. Zakariya-Razi (kitab Ul Mansoori) when natural evacuation suppressed akhlat e gair tabiya (morbid matters) accumulates causing Anxiety, melancholia, agitation, Excess leads to weakness, anxiety, irritability. Retention leads to toxic accumulation, depression, grief, tension [25]

Naum wa Yaqza : sleep and wakefulness

Sleep occurs due to dominance of Barid Ratab Mizaj (in brain) .Ibn sina stated “Day sleep increases belghm, Night sleep increases Rejuvenation.”

Brain needs cooling (Tabreed) and Tarteeb (moisture for sleep).sleep arises when Hararat e Ghareezi moving inward cooling of brain.stress and excessive thinking (kasarat e tafakhur) increases hararat(heat) and yaboosat (dryness).This imbalance prevents brain from cooling leads to Sahar (insomnia).Stressful thoughts (Afkaar-e-Muztariba) cause increase in Sauda.Heat & dry temperament of the brain (Seher e Saudaawi).

In stress Hararat e Dimag increases Yubusat asaab (dryness of nerves) leads to increased Sauda (overthinking) Continuous thinking causes Yabusat of nerves, prevents normal sleeping .Sleep is important to relieve stress; regulates mood & emotional stability. Sleep promotes digestion & metabolism,enhances cognitive functioning & memory consolidation,alleviates fatigue and restores energy [20]

According to Hippocrates sleep is body innate vital force and mechanism which helps to maintain body's equilibrium sp allowing prepare functioning of cell ,tissues,organs.[21]

Seher is state of extreme wakefulness that produces dryness (Yubusat) in the brain.Characteristised by abnormal conditions of wakefulness caused when dimagi rooh (vital force of brain excessively utilized, motor & sensory action (his o Hakrat) emotional states can also induce sleep by heating up the brain, attracting moisture towards the heated part of the body, this attraction of moisture is analogous to

behaviour of lantern flame. Sheikh Md Abdul Sabeih in book 'Shifa-ulAmraaz' Sahar is prolonged wakefulness is caused by extreme dryness of brain/humours like Sauda, safra, belgm Shaur According to Rabban Tabri, the best time to sleep is between 9 pm - 4 am (saudawi time) In Humans Melatonin has diurnal variations- Hormone-secretion increases soon after the onset of darkness. Peaks in the middle of night between 2-4 am. Gradually falls during the last half of the night. Ibn e Rashad stated "If diet is moderate, exercise is properly done, massage & Hammam is wisely used, proper sleep is attained, stress is managed & fresh air is breathed in then there is no requirement of medicine.[23-24]

Four stages of Sleep :

NREM 1: Transition period between wakefulness & sleep. Lasts around 5-10 minutes.

NREM 2: Body temperature drops. Heart rate lowers to slow. The brain begins to produce sleep spindles & lasts approximately 20 minutes.

NREM 3: Muscle relax. Blood Pressure & Breathing rate drops. Deepest sleep occurs.

REM Sleep: Brain becomes more active. The body becomes relaxed & immobile. Dreams occur. Eyes move rapidly.[21]

Unani - Pre-sleep stage (drowsiness): Hararat & Rutubat (heat & moisture) accumulates in the brain leading to heaviness which is Nau's (drowsiness), sensory and motor faculties starts to slow.

Deep Sleep (Naum ghareezi) : Complete closure of sensory perception. Small heat moves internally. Helps digestion. Tissue repair. Memory consolidation.

REFERENCES:-

1. Nayak , P., Ali , M., & D.R, B. (2024). Prevalence and Impact of Stress in the Indian Population: A Retrospective Survey Analysis. *South Eastern European Journal of Public Health*, 1476–1485. <https://doi.org/10.70135/seejph.vi.2112>
2. McEwen BS, Akil H. A comprehensive overview on stress neurobiology: basic concepts and clinical implications. *Neuropsychopharmacology*. 2020;45(1):3-20.
3. Khan MH. Analysis of stress level through EEG and its management with special reference to Unani principles. *JSPB*. 2023; 1:120–126.
4. Shah, S. M. (2016). "Stress and Safra: A Unani perspective." *International Journal of Unani Research*, 7(4), 102-110
5. Khan AA, Rahman S, Ahmed Z. Concept of Intirāq in Unani medicine: a correlation with oxidative stress and future perspectives. *J Res Unani Med*. 2022;5(2):78–85.
6. Chu B, Marwaha K, Sanvictores T, Awosika AO, Ayers D. Physiology, Stress Reaction. 2024 May 7. In: StatPearls [Internet]. Treasure Island (FL): StatPearls Publishing; 2025 Jan–. PMID: 31082164.
7. Thomson EM. Air Pollution, Stress, and Allostatic Load: Linking Systemic and Central Nervous System Impacts. *J Alzheimers Dis*. 2019;69(3):597-614. doi: 10.3233/JAD-190015. PMID: 31127781; PMCID: PMC6598002.
8. Kabeeruddin AM. Tarjuma wa Shrah Kulliyate Quanoon. Idare Kitabul Shifa, Delhi, 151-154, 1999. Firdaus et. al., *Am. J. PharmTech Res*. 2016;6(1) ISSN: 2249-3387
9. Al-Razi ABMZ. *Al-Hawi fi al-Tibb*. Vol 3. Beirut: Al-Kitab al-Ilmiya; 2000. p. 25-32.

10. entral Council for Research in Unani Medicine. Preventive and promotive healthcare. In: USM: The Science of Health and Healing. New Delhi: Ministry of AYUSH, Government of India; 2016. Chapter 3.
11. chikowski T, Sugiri D, Ranft U. Air quality and chronic stress: a representative study of air pollution in Germany. *Int J Hyg Environ Health*. 2015;218(3):305–312.
12. Najīb al-Dīn al-Samarqandī. *Kitāb al-Asbāb wa al-‘Alāmāt*. New Delhi: Idāra Kitāb-ul-Shifā; 2009. p. 102–110.
13. Al-Razi ABMZ. *Al-Hawi fi al-Tibb*. Vol 3. Beirut: Al-Kitab al-Ilmiya; 2000. p. 25-32. Yau YH, Potenza MN. Stress and eating behaviours. *Minerva Endocrinol*. 2013;38(3):255-267
14. Fatma A, Perveen A, Rehman SU, Khan R. Unani Medicine: Significance of Asbab-e-Sitta Zarooriya in times of Pandemic COVID-19. *J. Drug Delivery Ther*. [Internet]. 2021 Jan.15[cited 2026Jan.4];11(1):156-61. Available from: <https://jddtonline.info/index.php/jddt/article/view/4636>
15. averas EM, Sutin AR, Reich RA, et al. Continuous access to snacks from weaning onwards in female rats causes weight gain, insulin insensitivity, and sustained leptin resistance in adulthood. *Physiol Behav*. 2019;201:165–174. doi:10.1016/j.physbeh.2018.11.026.
16. Jurjani I. *Zakhira Khwarizam Shahi*. Vol 1. New Delhi: Idara Kitabul Shifa; 2010. p. 278–285.
17. sman M, Ashraf SM. Unani perspective in the prevention and treatment of psychiatric disorders. *Int J Unani Integ Med*. 2025;9(2):258–263.
18. Shah NSM, Basri NA, Ibrahim MA, Nik Hashim NW. Correlation between emotion regulation and mental well-being among university students during COVID-19. *Jurnal Psikologi Malaysia*. 2024;38(1):1–10. doi:10.21315/jpm2024.38.1.1.
19. Kumar R, Ul Haq E. Six essential causes of health in Unani medicine (Asbab-e-Sitta Zarooriya) and their parallels in lifestyle-based disease prevention. *IntJUnaniIntegMed*. 2025;9(2):145–147. doi:10.33545/2616454X.2025.v9.i2b.353.
20. Jabin F. Contemplating Sleep and its Related Disorders in the Perspective of Unani Tib. *J Sleep Med Disord*. 2015;2(1):1012. doi:10.47739/2379-0822/1012.
21. Kabeeruddin AM. *Tarjuma wa Shrah Kulliyate Quanoon*. Idare Kitabul Shifa, Delhi, 151-154, 1999. Firdaus et. al., *Am. J. PharmTech Res*. 2016;6(1) ISSN: 2249-3387
22. Kabeeruddin AM. *Tarjuma wa Shrah Kulliyate Nafeesi*. Idare Kitabul Shifa, Delhi, 278, 424-427, 2009.
23. Ibn Sīnā IA. *Al-Qānūn fī al-Ṭibb*. Vol 4, *Kitāb al-Amrāḍ al-Ra’s wa al-Dimāgh* (Diseases of the Head and Brain). Urdu translation by G H Kantoori. New Delhi: Aijaz Publishing House; 2010. p. 90–98.
24. Ibn Sīnā. *Al-Qānūn fī al-Ṭibb* [The Canon of Medicine]. Vol 1. Beirut: Dār al-Kutub al-‘Ilmiyya; 1999. p. 10–20 (Maqāla 1 Flesh on Ihtebāz); p. 35–45 (Maqāla 4 Bāb al-Ihtebāz).