



# UNRAVELLING THE STRESS-AGNI NEXUS THROUGH AYURVEDA: A CROSS-SECTIONAL STUDY

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**Abstract:** Background: Stress is a widespread element of contemporary existence, affecting persons in multiple fields. Ayurveda, an ancient medical tradition, acknowledges the impact of stress on Agni, the body's metabolic process. This study investigates the correlation between stress levels and Agni status among individuals residing in Shiroda and Ponda, Goa. Methods: A cross-sectional design was utilized to gather data, enlisting 150 participants from Shiroda and Ponda Taluka. Standardized questionnaires were utilized to get data on stress levels and Agni status. Statistical analyses, such as correlation were performed using SPSS 20. Results: The majority of participants fell within the age range of 26-35 years, with a small male preponderance. The average felt stress score was  $21.5 \pm 6.3$ , and males reported higher stress levels compared to females. The analysis of Agni status distribution showed a substantial percentage of individuals with Manda Agni, whereas a noteworthy amount displayed Vishamagni. The correlation study revealed a moderately favourable association between stress levels and Agni status. Discussion: Our findings accord with prior research, indicating stress's disruptive effects on Agni and its consequences for health. Integrating Ayurvedic principles with modern techniques offers interesting opportunities for holistic stress management. Community-based methods and legislative changes are crucial for alleviating stress-related inequities and boosting population health. Conclusion: This study contributes to understanding stress-Agni dynamics, underlining the necessity of holistic approaches to stress treatment. Recognizing the interconnectivity of stress and Agni status informs focused actions for boosting overall well-being. Further research is needed to explore additional parameters impacting stress-Agni dynamic.

**Index Terms** - Stress, Agni, Psychological well-being, Digestive health, Ayurveda.

## Introduction:

Stress, a prevalent feature in modern society, emerges in numerous forms and affects individuals across distinct circumstances. Its impact extends beyond the workplace, infecting academic institutions, as indicated by the high prevalence of stress among medical students. In Ayurveda, an ancient system of medicine originating from the Indian subcontinent, stress is considered to exert profound effects on Agni, the digestive power within the body. The connection between stress and Agni has attracted substantial attention in recent years, motivating various research to study this link through the perspective of Ayurvedic principles.

According to Ayurveda, Agni plays a crucial role in the preservation of total health and well-being. It affects the process of digestion, metabolism, and assimilation of nutrients, consequently impacting the body's physiological homeostasis. When Agni is in a state of equilibrium, known as Samagni (Balanced Bio-Fire/digestive power), it facilitates efficient digestion and metabolic activities. However, the beginning of stress can disrupt this delicate equilibrium, leading to derangements in Agni and associated health ramifications.

The postulated mechanisms underpinning stress-induced alterations in Agni focus around the idea of doshas, the fundamental energies that govern physiological processes in Ayurveda. Stress is believed to induce an

imbalance in doshas, notably an increase in Vata dosha, which is associated with traits such as dryness, movement, and irregularity. This imbalance in Vata dosha might affect Agni, hindering the digestive process and metabolism. Furthermore, stress-induced variations in Agni may impair the quality of food taken, increasing digestive difficulties and adding to the accumulation of toxins, known as Ama, in the body.

Given the multidimensional nature of stress and its potential repercussions on Agni, there is a pressing need for robust scientific investigation to clarify this complicated link. In light of this, the present study utilizes a cross-sectional approach to explore the influence of stress on Agni according to Ayurveda. A cross-sectional study methodology is well-suited to obtain a snapshot of the link between stress and Agni within a certain group at a given point in time. By employing this design, the study aims to assess the prevalence of stress and its association with Agni derangement among participants, providing valuable insights into the broader implications for health and well-being.

In addition to the study design, the development and implementation of a thorough questionnaire will serve as a vital tool for data gathering and analysis. The questionnaire will be methodically constructed to capture essential information regarding to stress levels, food habits, digestive complaints, and perceived changes in Agni among participants. By including both qualitative and quantitative indicators, the questionnaire will permit a comprehensive investigation of the subtleties involved in the stress-Agni interaction, helping the researchers to gain important insights from the data.

Furthermore, the adoption of a cross-sectional design is particularly advantageous for gathering a broad range of people and discovering potential correlations between stress and Agni across different demographic and lifestyle characteristics. By selecting participants from varied backgrounds and age groups, the study intends to strengthen the generalizability of its findings and provide a thorough understanding of the stress-Agni link within the larger community. Additionally, the cross-sectional design allows for the simultaneous investigation of several variables, enabling researchers to explore potential confounding factors and understand the underlying mechanisms generating the observed relationships.

In summary, this study aims to look into the influence of stress on Agni according to Ayurveda, adopting a cross-sectional methodology and a precisely prepared questionnaire to understand this intricate interplay. By shedding insight on the mechanisms driving stress-induced alterations in Agni and their consequences for health and well-being, this research hopes to contribute to a greater understanding of Ayurvedic principles and their applicability in modern circumstances.

### **Review of literature:**

Ayurveda, the ancient Indian system of medicine, not only focuses on physical problems but also promotes the complete well-being of individuals. Central to Ayurvedic ideas is the concept of Agni, or digestive fire, which plays a crucial role in sustaining health and preventing disease. Several studies have studied the complicated link between psychosocial factors and Agni function. For instance, a critical assessment underlines the role of Manas Bhav, or mental elements, in the genesis of Ama, an undigested toxic substance believed to be the root cause of many diseases according to Ayurveda.<sup>1</sup> Imbalances in Manas Bhav, such as anxiety or ambition, can disturb Agni, leading to the creation of Ama and associated health concerns. Similarly, the systematic study underscores the role of psychological factors on Grahani Roga, a common gastro-digestive condition. The disturbance in Agni owing to Vata and Pitta Dosha, influenced by mental conditions, can greatly impact Grahani function. These findings underscore the importance of treating psychological concerns in the management and prevention of digestive disorders according to Ayurvedic principles.<sup>2</sup>

Moreover, modern research has further highlighted the therapeutic importance of Agni and its association with psychological stress. A comprehensive overview digs into the many forms of Agni and their significance in metabolic activities. The text underlines that Agni, when working ideally, maintains the balance of Dosha, Dhatu, and Mala, hence fostering overall wellness. However, stress, particularly worry, has been found as a key disruptor of Agni, leading to impaired digestion and metabolic problems. The connection between stress and Agni underlines the need of stress management in sustaining digestive health and overall well-being.<sup>3</sup> Additionally, another study gives an analytical evaluation on the influence of Chinta, or anxiety, on Agni and associated metabolic diseases. Chronic stress changes enzyme production and gastrointestinal motility, resulting to digestive problems and metabolic abnormalities. Understanding the complicated link between stress and Agni is vital for establishing effective therapeutic options for controlling metabolic diseases and boosting digestive health.<sup>4</sup>

Furthermore, Ayurveda's insights into the involvement of Manasik Bhava, or psychological elements, in Grahani Roga have attracted interest in contemporary studies. A scientific inquiry analyzes the influence of psychological elements on Grahani function, emphasizing the substantial role of Vata and Pitta Dosha in altering mental states and exacerbating Grahani illnesses. The incorporation of psychological examinations and

therapies into the management of Grahani Roga demonstrates the holistic approach of Ayurveda towards healthcare. These studies collectively underline the delicate relationship between psychological factors, Agni function, and digestive health, providing useful insights for both Ayurvedic and Western medical methods in addressing gastrointestinal illnesses and metabolic imbalances.<sup>5</sup>

Moreover, present research in modern medicine corroborates the delicate link between psychological stress and gastrointestinal function. Studies have indicated a substantial link between stress, worry, and depression, and variations in salivary flow rate, which can contribute to xerostomia. The findings imply that psychological factors not only influence digestive function but also impact salivary gland secretion, underlining the systemic impacts of stress on multiple areas of the digestive system.<sup>7</sup> Additionally, another study explores the effect of emotional stress and depression on the occurrence of digestive diseases, demonstrating a high association between psychological discomfort and functional gastrointestinal disorders such as functional dyspepsia and irritable bowel syndrome. The study underlines the necessity for psychological screening in gastrointestinal patients to enhance treatment outcomes and increase overall well-being.<sup>8</sup>

Furthermore, research efforts have concentrated on identifying the processes behind the link between stress and functional gastrointestinal disorders (FGIDs) in modern medicine. Studies study the role of corticotropin-releasing factor (CRF) in mediating stress-induced variations in gastrointestinal motility and sensitivity, showing the key involvement of neuroendocrine pathways in stress-related gastrointestinal dysfunction.<sup>10</sup> Moreover, study looks into the brain-gut interface in irritable bowel syndrome (IBS), emphasizing the high frequency of psychiatric problems such as anxiety and depression in individuals with IBS. The paper suggests a brain-gut paradigm for IBS, arguing that abnormalities in central nervous system function contribute to the pathophysiology of the condition. These findings underline the intricate connection between psychological stress and gastrointestinal function in the development and management of FGIDs, offering useful insights for tailored therapy strategies focused at addressing both physical and psychological components of digestive health.<sup>11</sup>

Moreover, recent discoveries have provided light on the impact of stress on Agni, a basic concept in Ayurveda reflecting the digestive fire responsible for metabolic activities. Studies have explored the association between stress and Agni imbalance, revealing how chronic stress can disturb the proper functioning of Agni, leading to metabolic diseases including gastrointestinal disturbances.<sup>6</sup> In the wake of the rising worldwide burden of stress-related disorders, understanding the complicated link between stress and Agni acquires crucial importance. Furthermore, rising evidence from modern medicine, as evidenced in studies that supports the hypothesis that psychological stress can alter digestive function, exacerbating symptoms of functional gastrointestinal diseases such as irritable bowel syndrome (IBS) and gastroesophageal reflux disease (GERD).<sup>10</sup>

These findings underline the necessity of understanding the role of stress in Agni dysfunction and its consequences for general health and well-being. In light of the increasing prevalence of stress-related disorders and the growing interest in integrative approaches to healthcare, understanding the mechanisms underlying the interaction between stress and Agni holds promise for the development of novel therapeutic strategies aimed at restoring balance and promoting holistic wellness. By addressing major research concerns such as the influence of stress on Agni balance and the effectiveness of integrative therapies in alleviating stress-related Agni disruptions, this study intends to give actionable insights for healthcare practitioners and policymakers. The ultimate purpose is to bridge the gap between old Ayurvedic wisdom and modern scientific understanding, paving the way for evidence-based methods to stress management and digestive health improvement.

### Methodology:

- **Study Setting:** The research conducted in Ponda, Goa, which is located in the western area of India. Ponda is recognized for its diverse population and provides an ideal site for exploring the impacts of stress on Agni.
- **Study Population:** The research population comprised of individuals dwelling in the Shiroda and Ponda rural areas of Goa. These regions were selected due to their accessibility and representativeness of the broader population in Ponda Taluka.
- **Sample Size:** A total of 150 volunteers recruited for the study. This sample size was calculated based on considerations of statistical power and practicality within the given time and resource restrictions. The sample size was calculated using the formula  $n = \frac{Z^2 N p q}{(N-1) d^2} + Z^2 p q$  (where, Z-value = 1.96, p = Taking anticipated prevalence 50 % = 0.5, q = 1 - p = 1 - 0.5 = 0.5, N = Known population, D = Allowable error = 10%), formula used for calculating sample size is commonly known as the formula for calculating sample size for estimating a population proportion using a confidence interval. It is also sometimes referred to as the margin of error formula.

- **Sampling Technique:** Participants picked using a random sample technique to ensure that each individual in the population has an equal chance of being included in the study. This strategy helps eliminate selection bias and ensures the generalizability of the findings.
- **Inclusion Criteria:** Participants who are willing to freely engage in the study included. This criterion ensures that only persons who are interested and consent to be part of the research included in the sample.
- **Exclusion Criteria:** Individuals who are not willing to participate or offer consent for the study eliminated. This criterion helps protect the integrity of the study process and guarantees that participants' rights and autonomy are maintained.
- **Data Collection Tool:** The data acquired utilizing a standard predesigned and pretested questionnaire. The questionnaire will include validated measures such as the Perceived Stress Scale (PSS) to assess individuals' levels of stress<sup>22</sup> and the Agnibala Assessment tool<sup>21</sup> based on Ayurvediy Granthokta (classical texts) Agni Parikshan Technique to evaluate their Agni status.
- **Data Collection Method:** Data acquired through an online Google Form, which offers a convenient and effective approach to get information from participants. The utilization of an online platform also helps reach a bigger and more diversified audience.
- **Data Analysis:** Descriptive statistics such as mean, standard deviation, and frequency distributions used to summarize the obtained data. Correlation research undertaken to explore the association between stress levels and Agni status. Data entered in MS Excel and statistical analysis performed using SPSS 20 software.
- **Ethical Consideration:** Ethical clearance approval for this study was obtained from the Institutional Ethics Committee on Human Subject and Research, Gomantak Ayurveda Mahavidyalaya & Research Centre, Shiroda, Goa, India. The research described in this article was conducted in accordance with the ethical standards set forth by the Institutional Ethics Committee on Human Subject and Research, Gomantak Ayurveda Mahavidyalaya & Research Centre. All data were collected and analyzed in accordance with relevant ethical guidelines and regulations. The study was conducted in conformity with ethical rules and principles to ensure the preservation of participants' rights and well-being. Informed consent received from all participants, and their confidentiality and anonymity protected throughout the research procedure.

## Result:

**Table 1: Demographic Characteristics of Study Participants**

Characteristic	Category	Frequency	Percentage
<b>Age (years)</b>			
	18-25	30	20%
	26-35	45	30%
	36-45	40	26.7%
	46-55	25	16.7%
	56+	10	6.7%
<b>Gender</b>			
	Male	80	53.3%
	Female	70	46.7%

Table 1: Demographic Characteristics of Study Participants This table provides the demographic profile of the study participants. It includes information on their age distribution and gender makeup. For example, it reveals that the majority of participants (30%) were in the age category of 26-35 years, followed by 26.7% in the age group of 36-45 years. In terms of gender, there were somewhat more male participants (53.3%) than female individuals (46.7%).

**Table 2: Perceived Stress Levels of Study Participants**

Perceived Stress (PSS Score)	Mean ± SD
Overall	21.5 ± 6.3
Male	22.3 ± 7.1
Female	20.7 ± 5.5

Table 2: Perceived Stress Levels of Study Participants This table provides the mean perceived stress scores of the study participants, together with their standard deviations (SD). The overall mean felt stress score was 21.5 ± 6.3, indicating a moderate level of perceived stress among the participants. It also includes separate mean

ratings for male and female participants, revealing that males reported slightly greater felt stress levels ( $22.3 \pm 7.1$ ) compared to females ( $20.7 \pm 5.5$ ).

**Table 3: Distribution of Agni Status among Study Participants**

Agni Status	Frequency	Percentage
Samagni (Balanced Bio-Fire/digestive power)	50	33.3%
Mandagni (Weak Bio-Fire/digestive power)	60	40%
Vishmagni (Imbalanced Bio-Fire/digestive power)	40	26.7%

Table 3: Distribution of Agni Status among Study Participants This table depicts the distribution of Agni status among the study participants. It categorizes individuals into three groups based on their Agni status: Mandagni (Weak Bio-Fire/digestive power), Samagni (Balanced Bio-Fire/digestive power), and Vishamagni. The table shows that the majority of participants (40%) had a Mandagni (Weak Bio-Fire/digestive power) status, followed by 33.3% with a Samagni (Balanced Bio-Fire/digestive power) status and 26.7% with a vishamagni position.

**Table 4: Correlation between Perceived Stress and Agni Status**

	Perceived Stress (PSS Score)	Agni Status
Pearson's r	0.45	Mandagni (Weak Bio-Fire/digestive power)
p-value	<0.001	

Table 4: Correlation between Perceived Stress and Agni Status This table provides the correlation analysis results between perceived stress levels and Agni status among the study participants. It includes Pearson's correlation coefficient (r) and the related p-value. The positive correlation coefficient (0.45) reveals a moderate positive association between perceived stress and Agni status, suggesting that higher levels of perceived stress are associated with an increased risk of Agni imbalance. The p-value (<0.001) indicates that this link is statistically significant, indicating it is unlikely to have occurred by chance.

### Discussion:

The found association between perceived stress levels and Agni status parallels the findings of prior studies, harmonizing with the fundamentals of Ayurveda and modern scientific understanding. Previous research have explored the delicate connection between psychological stress and physiological function, emphasizing the significance of stress in interrupting digestive processes and Agni function.<sup>12</sup> Our data substantiate this, revealing a moderate positive connection between perceived stress levels and Agni imbalance. Moreover, the bidirectional association between stress and gastrointestinal function, suggests that Agni problems can contribute to heightened stress levels, further worsening the imbalance.<sup>13</sup> This underlines the necessity of holistic methods to stress management that address both psychological and physiological elements of well-being.

The demographic profile of study participants offers useful insights into the gender-specific subtleties of stress experiences. Research underlines the distinct impact of stresses on males and females, highlighting variances in stress coping systems and vulnerability to stress-related disorders.<sup>14</sup> Our data support this, with male participants reporting slightly higher levels of felt stress compared to their female counterparts. This gender gap in stress levels may be ascribed to socio-cultural variables, as addressed in research paper, stressing the necessity for gender-sensitive treatments in stress management programs.<sup>15</sup> Furthermore, the significance of lifestyle factors, including nutrition and physical activity, in modifying stress responses. Integrating Ayurvedic dietary concepts and stress management strategies may offer a holistic approach to building resilience and well-being.<sup>16</sup>

In addition to individual-level factors, environmental and societal forces have a vital role in influencing stress experiences and Agni function. Research study dives into the impact of socio-economic inequality and environmental stresses on health outcomes, emphasizing the necessity for upstream interventions to address structural determinants of stress.<sup>17</sup> By taking a socio-ecological viewpoint, treatments can target multi-level issues contributing to stress and Agni imbalance.<sup>18</sup> This underlines the relevance of community-based initiatives and policy-level changes in enhancing population health and eliminating health inequalities.

Moreover, our study emphasizes the possibility of integrative therapies to alleviate the detrimental effects of stress on Agni and overall well-being. By combining Ayurvedic principles with evidence-based practices, interventions can exploit the synergistic effects of mind-body therapies, dietary adjustments, and stress

reduction strategies. The efficacy of Ayurvedic therapies, such as herbal remedies and lifestyle modifications, in restoring Agni balance and reducing stress-related symptoms. Integrating these therapies into mainstream healthcare settings holds promise for addressing the core causes of stress-related diseases and promoting optimal health outcomes.

In conclusion, this work contributes to the growing body of evidence supporting holistic approaches to stress management and Agni improvement. By unraveling the mechanisms driving stress-induced Agni abnormalities and researching integrative therapies, we want to expand our understanding of mind-body connections and better clinical management. Moving forward, greater study is necessary to explore the long-term impacts of integrative therapies and their potential to revolutionize healthcare paradigms. By embracing a complete approach to stress management inspired by Ayurvedic wisdom and modern scientific discoveries, we can enable individuals to grow resilience and survive in today's complex environment.

### **Conclusion:**

The study has revealed useful insights regarding the relationship between perceived stress levels and Agni status among the study subjects. The demographic profile of the participants reveals a diversified sample characteristic, with a majority in the age category of 26-35 years and a somewhat higher proportion of male participants. This diversity promotes the generalizability of the findings to a broader population.

Overall, the study indicated a moderate degree of perceived stress among the participants, with male participants reporting slightly greater levels compared to females. This gender disparity in perceived stress levels highlights the significance of adopting gender-specific stress management strategies and interventions.

Analysis of Agni status distribution found a considerable proportion of persons with a Mandagni (Weak Bio-Fire/digestive power) Agni status, although a notable portion demonstrated a Vishamagni Agni state. This highlights potential abnormalities in the participants' digestive processes, underscoring the need of evaluating Agni status as a critical component of overall health and well-being.

The correlation study further clarified a moderate positive association between perceived stress levels and Agni state, indicating that higher levels of perceived stress are related with an increased risk of Agni imbalance. This underlines the interdependence of psychological stress and physiological health, underlining the necessity for holistic approaches to stress management.

In conclusion, the findings underline the value of Agni in the context of stress management and general health. By identifying the relationship between stress and Agni status, focused interventions may be devised to improve balance and harmony within the body-mind continuum, ultimately promoting overall health and well-being. Further study is necessary to explore additional elements impacting stress-Agni dynamics and to evaluate the efficacy of therapies in promoting optimal health outcomes.

### **Declarations:**

- Ethics approval and consent to participate: Ethical clearance approval for this study was obtained from the Institutional Ethics Committee on Human Subject and Research, Gomantak Ayurveda Mahavidyalaya & Research Centre, Shiroda, Goa, India. The research described in this article was conducted in accordance with the ethical standards set forth by the Institutional Ethics Committee on Human Subject and Research, Gomantak Ayurveda Mahavidyalaya & Research Centre. All data were collected and analyzed in accordance with relevant ethical guidelines and regulations. The research described in this article was conducted in accordance with the ethical standards. All participants provided their informed consent prior to their involvement in the study, and all data were collected and analyzed in accordance with relevant ethical guidelines and regulations.
- Consent to participate: All participants in this study were provided with a detailed explanation of the study's purpose, procedures, risks, and benefits prior to providing their consent. Participants were given ample opportunity to ask questions and were provided with clear and accurate information to ensure that their consent was well-informed. Furthermore, participants were informed that their participation was entirely voluntary and that they could withdraw at any time without penalty or negative consequences. By providing their consent to participate in this study, participants are indicating that they have been fully informed and understand the nature and implications of their involvement.
- Consent for publication: Online informed consent was obtained from all participants included in this study prior to publication of any identifiable information. Participants were informed that their personal information would be kept confidential and that their identities would not be disclosed in any publication resulting from this study. Participants were also informed that they had the right to review and approve any manuscript resulting from the study before publication. By providing their consent for publication,

participants are indicating that they have reviewed and approved the manuscript and that they understand and accept the implications of publication.

- Availability of data and materials: The datasets generated during and/or analysed during the current study are available from the corresponding author on reasonable request.
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- Authors' contributions: Dr. Sameer Joshi conceptualized and designed the study, providing expertise in Ayurveda and public health. He was involved in the acquisition, analysis, and interpretation of data, ensuring the accuracy and validity of the findings. Dr. Joshi contributed significantly to drafting the manuscript, revising it critically for important intellectual content, and finalizing the version to be submitted for publication. Additionally, he provided approval for the final version to be published and agreed to be accountable for all aspects of the work, ensuring integrity and accuracy throughout the research process.
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