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ORA- Cross Sectional Study

EXPLORING THE LINK BETWEEN *GRAHANIDOSHA,* AND CHRONIC NECK AND BACK PAIN: A CROSS-SECTIONAL STUDY

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ABSTRACT :

Introduction: Chronic back pain is a significant public health problem, often leading to work absenteeism. Traditional treatments may not fully address the root causes, particularly the role of gut health in chronic pain. This study explores the association between *grahanidosha,* a digestive dysfunction concept in Ayurveda, and chronic neck and back pain. **Methodology:** A cross-sectional analysis was carried out at VPSV Ayurveda College Hospital, Kottakkal involving 164 patients with chronic neck and back pain. The study used a newly validated assessment tool to identify *grahanidosha,* examining its prevalence and association with pain. Inclusion criteria were patients aged 20-45 with pain persisting for over three months, excluding those with traumatic, infective, or malignant causes. **Results:** The study demonstrated a significant link between *grahanidosha* and chronic back pain, with 109 out of 164 patients (66.5%) exhibiting features of *grahanidosha*. A statistically significant association was found between *grahanidosha* and pain involving both the neck and upper back ($\chi^2 = 8.362$, $p = 0.004$), as well as between the neck and low back ($\chi^2 = 4.756$, $p = 0.029$). Further, on analysing the relation between *doṣha* predominance and sites of pain, significant associations were observed between *pittaja grahanidosha* with neck and low back pain (OR = 2.88; 95% CI: 1.21–6.86; p = 0.014), *kapha-vataja grahanidosha* with neck and low back pain (OR = 2.82; 95% CI: 1.07–7.44; p = 0.031), and *vataja grahanidosha* with combined pain involving the neck, upper back, and low back (OR = 5.43; 95% CI: 1.85–15.94; $p < 0.001$). **Discussion:** The findings indicate that *grahanidosha*, representing impaired digestive function in Ayurveda, may be an important underlying factor in chronic neck and back pain. This resonates with emerging biomedical concepts such as the gut-brain axis and the role of gastrointestinal disturbances in systemic inflammation and chronic pain, suggesting potential for integrative treatment modalities. **Conclusion:** The observed link between disturbed digestive function and chronic musculoskeletal pain suggests new possibilities for integrative care. Ayurvedic frameworks like *grahanidosha* offer meaningful perspectives; however, robust clinical research is needed to validate these concepts before their inclusion in standard pain management approaches.

KEYWORDS: *Grahanidosha,* Chronic neck and backpain, Ayurveda, Cross sectional survey.

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1. INTRODUCTION

Chronic back pain poses a major global health concern and remains a leading factor contributing to work absenteeism.[1] A recent survey conducted in South India reported that more than 28% of men and nearly 53% of women had experienced low back pain.[2] According to accepted clinical guidelines, back pain lasting more than three months is typically classified as chronic.[3] In many instances of chronic back pain, no discernible pathology, such as a disc prolapse, is evident. While modern medicine typically advocates physiotherapy and lifestyle changes for managing chronic back pain,[4] a significant number of patients seek Ayurvedic treatment for such conditions, making it one of the most frequent complaints encountered in Ayurvedic practice. Conventional ayurvedic treatment approaches often fall short of providing complete relief, potentially due to their inability to identify and target the underlying root cause of the condition.

Emerging research highlights the involvement of gut-related pathways in the onset and persistence of chronic pain conditions, including those affecting the back.[5] In current Ayurvedic practice, existing treatments for chronic neck and back pain predominantly address musculoskeletal complaints, often overlooking underlying digestive dysfunctions. Patients presenting with chronic pain in the upper and lower back are currently managed within the framework of *Vata* (one of the three *doshas*) disorders in Ayurveda. However, this approach proves efficacious only in cases where a specific musculoskeletal pathology or trauma is identifiable. Clinical practice observations reveal that many patients with spontaneous onset of back pain also exhibit gastrointestinal symptoms indicative of *agni* (factor that governs digestive and metabolic functions) derangement. In Ayurveda, the process of digestion and assimilation is explained through the concept of *agni*, which encompasses gastrointestinal functions such as digestion, motility, and absorption.[6] The balance of *agni* is intricately regulated by the three *doshas—Vata, Pitta*, and *Kapha*—and any disturbance in their equilibrium can impair Agni, manifesting as digestive dysfunctions that reflect the characteristics of the predominant disturbed *dosha.* Disorders of *agni*, or *agni* dysfunctions, are broadly considered under the umbrella term of *grahanidosha* (Ayurvedic morbidity code-LG1.1).[7] In Charaka Samhita, within the context of *grahani roga* (a disorder of the lower GI tract), *vatajagrahani dosha* (E.B.7.2) is described with clinical features such as *ruja* (pain) occurring in the *parswa* (flank), *uru* (thigh), *vankshana* (groin), *greeva* (back of neck), and *kati* (low back), alongside *koshta* (gastrointestinal tract) symptoms. Further, in line with recent understandings of gut related mechanisms in chronic pain, exploring the association of *grahanidosha* in patients with chronic back pain could provide new insights into its pathogenesis, thus enabling the development of appropriate management strategies.

A pilot cross-sectional study conducted at VPSV Ayurveda College Hospital revealed potential association between chronic neck and back pain and features of *agni* derangement.[8] Among the 28

patients analysed, a significant correlation was observed between pain in the cervical and lumbar regions and *koshta* symptoms such as *vibandha* (constipation), which exhibited a notable correlation with lower back pain, reflected by an odds ratio of 4.2 ($P < 0.05$). In cervical pain cases, several gastrointestinal symptoms—such as *avipaka* (indigestion), *aruchi* (loss of appetite), *amlodgara* (sour belching), *urodhumayana* (heartburn), and *muhurbaddha muhurdrava pureesha* (alternating bowel patterns)—were observed. Among these, *avipaka* demonstrated the strongest association, with an odds ratio of 5 ($P < 0.01$). These observations indicate a possible relationship between *grahanidosha* and chronic neck and back pain. A deeper exploration of this connection may shed light on the underlying pathological mechanisms and aid in adapting Ayurvedic treatment approaches for chronic pain disorders, particularly those involving the spine. Considering this, the present study aimed to determine the prevalence of *grahanidosha* in patients suffering from chronic neck and back pain, thereby establishing a foundation for further exploration of its clinical significance.

2. METHODOLOGY

This observational study employed a cross-sectional design to explore the relationship between chronic neck and back pain and features of *grahanidosha*, using a tool tailored for this assessment. The tool was developed and validated as part of the first author's PhD research.

Study Setting - The study was carried out in the outpatient (OPD) and inpatient (IPD) departments of VPSV Ayurveda College Hospital, Kottakkal. Ethical clearance was secured from the Institutional Ethics Committee of VPSV Ayurveda College, Kottakkal, and the cross-sectional study was registered with the Clinical Trial Registry of India.

Study Population - The study population comprised patients experiencing chronic neck and back pain who sought medical care at the outpatient and inpatient departments of VPSV Ayurveda College Hospital in Kottakkal.

Inclusion & Exclusion Criteria

Inclusion Criteria:

- Individuals aged between 20 and 45 years.
- Patients experiencing chronic pain (lasting more than 3 months) localized to the neck, upper back, lower back, or involving all these regions.

Exclusion Criteria:

- Cases of back pain attributed to trauma, infections, or malignancies.
- Patients diagnosed with other significant systemic illnesses.

Sample Size - The sample size was calculated to be 164, based on a reported chronic back pain prevalence of 42%. The calculation used the following parameters: $Z = 1.96$, a reported prevalence (P) of 42%, and a margin of error (d) taken as 18% of P.

Patient Recruitment: Patients were recruited through consecutive sampling, with those meeting the inclusion criteria invited to participate during their visits to the outpatient and inpatient departments of VPSV Ayurveda College Hospital, Kottakkal. All eligible individuals

received detailed information about the study objectives, and written informed consent was obtained prior to enrolment. This method ensured a systematic selection process, enabling the enrolment of a representative study sample. The recruitment phase commenced on November 1, 2023, and continued until April 30, 2024, allowing for the enrolment of participants who met the eligibility criteria and consented to participate.

Characteristics of the Assessment Tool - The assessment tool employed in the survey comprised three sections designed to comprehensively evaluate *grahanidosha* in patients with chronic neck and back pain. The first section included identification data, the site of pain, and its duration. The second section featured four screening questions aimed at preliminary evaluation. Following the screening questions, the tool included questions and response options to assess various domains of *grahanidosha*, including appetite, digestion, extra-GI manifestations, and psychological factors. The scoring method employed a Likert scale system based on the frequency of respective features over the preceding one-month duration. The diagnostic tool for *grahanidosha* underwent rigorous validation processes and demonstrated high content validity (CVI of 0.916), strong construct validity (correlation coefficient of 0.949, P = 0.004), good internal consistency (Cronbach's alpha of 0.707), and perfect inter-rater agreement (Kappa score of 1.000, SE = 0.000, P = 0.014). These metrics collectively confirm the tool's superior reliability and validity, establishing it as an effective method for assessing *grahanidosha* in patients with chronic neck and back pain.

Assessment of dosha predominance of *grahanidosha*: The tool assesses *dosha* predominance through a systematic scoring method. The diagnosis of *grahanidosha* or *samagni* (balanced state of *agni*) was made based on the scores obtained in each category of response options, including *Vata pradhana* (vata predominant)*, Pitta pradhana (pitta predominant), Kapha pradhana (Kapha predominant), and Samagni (*balanced state of *agni)*, for each domain of questions. When the combined score of the *doshas* exceeds the *'samagni'* score, a diagnosis of *grahanidosha* is made. Subsequently, the *dosha* predominance is determined by the highest individual *dosha* score. If two or more *doshas* have similarly high scores, a dual *dosha* or *tridosha* (all the three *dosha*) pathology is diagnosed. In cases where the total score closely approximates the *'samagni'* score, a difference greater than the 10th percentile is used to make the decision. For example, if the total score for *grahanidosha* exceeds the *'samagni'* total by more than the 10th percentile, *grahanidosha* is diagnosed. Conversely, if the *'samagni'* score is higher by more than the 10th percentile, *samagni* is considered.

Statistical methods employed: For the statistical analysis of the cross-sectional survey data, descriptive statistics were used to summarize the characteristics of the study population and key variables. Further, frequency distributions, cross-tabulations, and chi-square tests were applied to examine the relationships

between factors such as the site of pain, duration of pain, and *grahanidosha*. All statistical computations were performed using SPSS software, version 29.

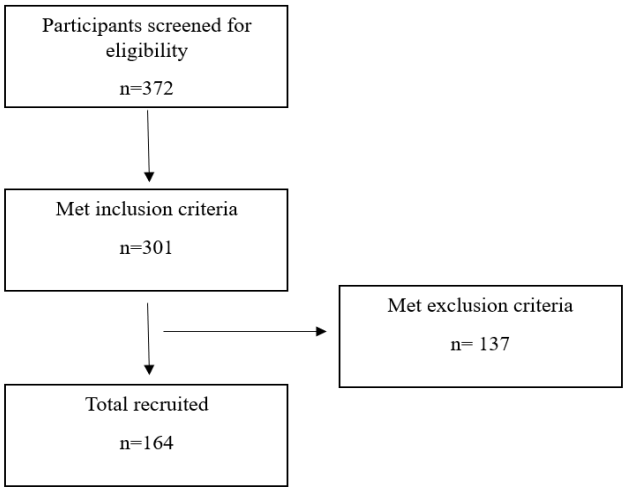
Measures to Reduce Bias and Confounding: This study employed strict inclusion and exclusion criteria to minimize potential confounding factors. To minimize potential biases, a consecutive sampling approach was employed to ensure a representative study population and reduce selection bias. All patients with chronic pain in the neck, upper back, lower back, or all these areas were included, and those with pain due to trauma, infections, malignancies, or systemic illnesses were excluded. The assessment tool was administered uniformly by trained investigators, mitigating observer bias. To address recall bias, participants were instructed to report symptoms based on the preceding one-month period rather than relying on long-term memory.

3. RESULTS

Patient Demographics - The demographic profile of the patients comprised a varied distribution across age and gender categories. Detailed demographic information, including age range distribution and gender distribution, is provided in the following sections of the results, along with an analysis of pain distribution, chronicity of pain, and responses to screening questions aimed at assessing symptoms related to *grahanidosha*.

A total of 372 patients with chronic neck and back pain were screened for eligibility, of whom 164 participants met the inclusion criteria and were recruited into the study.

Fig 1 – Participant flow chart



Age distribution

45% of the patients fell within the age group of 31-40 years, while 41% were in the age group of 41-45 years. Additionally, 12% of the patients were between the ages of 20-30 years **(Table 1).**

Table 1 - The age wise distribution of patients

Age range	No of patients	Percentage
Age 20 – 30	21	12.80%
Age 31- 40	75	45.73%
Age 41-45	68	41.46%

Gender wise distribution

The distribution of patients according to gender is as follows: 63 patients were male, constituting approximately 38.41% of the sample, while 101 patients were female, making up approximately 61.59% of the sample **(Fig 2)**.

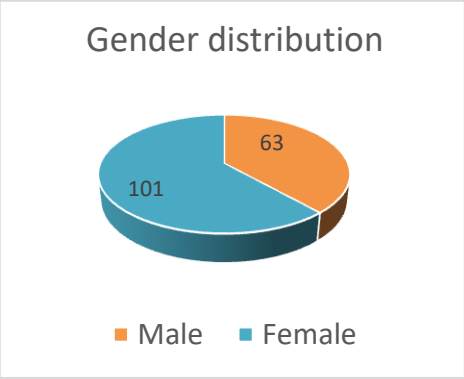


Fig 2- Gender wise distribution of the patients

Distribution of pain among study participants

The tool assessed the predominant site of pain in the patients and the distribution of pain was as follows: 11 patients (6.7%) reported neck pain, 71 patients (43.3%) experienced low back pain, nine patients (5.5%) had both neck and upper back pain, 51 patients (31.1%) had both neck and low back pain, six patients (3.7%) reported both upper back and low back pain, and 16 patients (9.8%) experienced pain in the neck, upper back, and low back concurrently.

Chronicity of pain

The chronicity of pain among the patients is as follows: 62 patients (37.8%) reported experiencing pain for 3-6 months, 53 patients (32.3%) had pain persisting between 6 months to 1 year, and 49 patients (29.9%) reported experiencing pain for more than 1 year **(Table 2)**.

Table 2 - Chronicity of pain

Chronicity	No of patients	Percentage
3-6 months	62	37.8%
6 months - 1 year	53	32.3%
More than 1 year	49	29.9%

Prevalence of general symptoms of *grahanidosha* in the patients

The initial section of the questionnaire comprised screening questions aimed at assessing general symptoms associated with *grahanidosha* in patients with chronic pain in the neck, upper back, or lower back regions, which included changes in the appetite, changes in the eating pattern, changes in the bowel habits as well as easy fatiguability (**Table 3)**.

Table 3 – Prevalence of general symptoms of *grahanidosha*

Symptoms	Yes	No
Changes in Appetite	70.1%	29.9%
Changes in Eating or Food Patterns	34.1%	65.9%
Changes in Bowel Habits	76.8%	23.2%
Easy Fatigability	34.1%	65.9%

Out of the surveyed patients, 115 (70.1%) reported experiencing changes in appetite, 56 (34.1%) noted alterations in their eating or food patterns during the preceding month, 126 (76.8%) reported experiencing changes in their bowel habits, and 56 (34.1%) indicated experiencing easy fatigability.

Prevalence of *grahanidosha* in patients with chronic neck and back pain

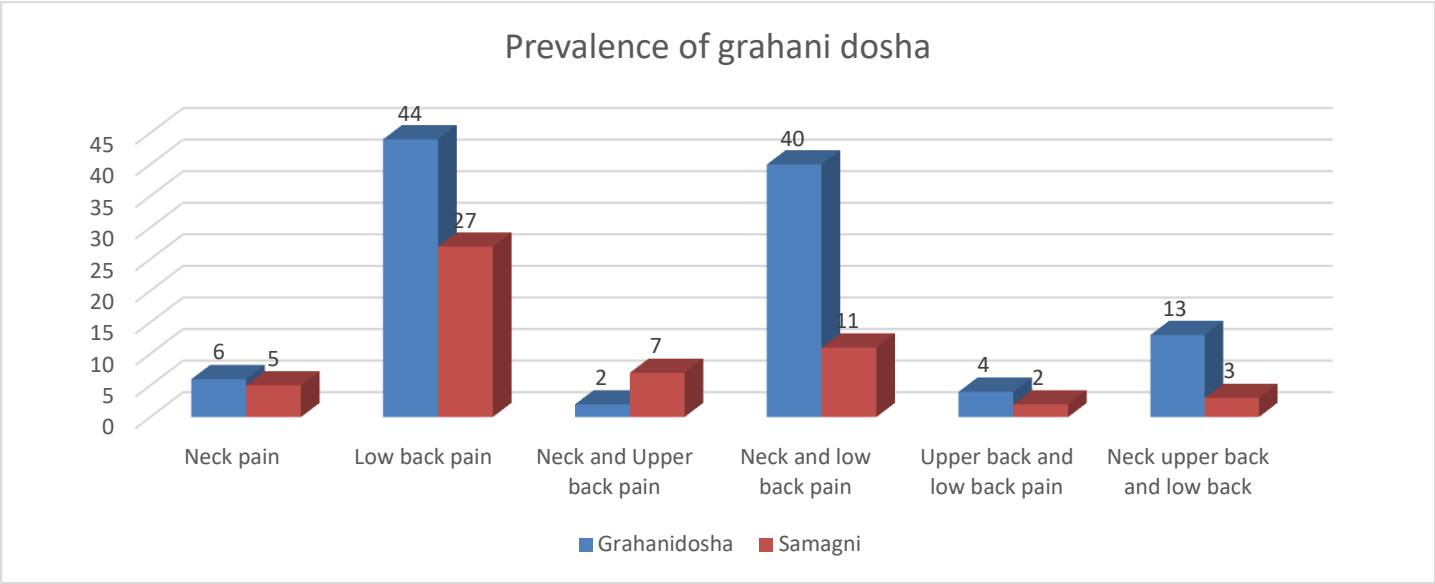
The prevalence of *grahanidosha* among patients with chronic neck and back pain was found to be 66.5% (95% CI: 59.2%–73.8%), based on the analysis of 164 patients categorized into *grahanidosha* or *samagni*. The odds of having *grahanidosha* compared to *samagni* in this population was 1.98 (95% CI: 1.33–2.96). **(Table 4)**.

Table 4 - Prevalence of *grahanidosha* in the study population

	Frequency	Percentage
Grahanidosha	109	66.5%
Samagni	55	33.5%
Total	164	100.0%
@ 95% CI:59.2%–73.8%		

Patients were then stratified into groups according to the specific sites of their pain. Through cross-tabulation, the analysis aimed to determine the prevalence of *grahanidosha* and *samagni* within each pain category. This methodology facilitated exploration of how frequently *grahanidosha* manifested in patients with different patterns of pain **(Fig 3)**

Fig 3 Prevalence of *grahanidosha* in different pain categories



Among patients with chronic neck and back pain, a significant number exhibited features of *grahanidosha*, including 44 with low back pain and 40 with both neck and low back pain. In contrast, fewer patients showed characteristics of *samagni*, with 27 in the low back pain category and 11 in the neck and low back pain group.

Association between Site of Pain and Grahanidosha

A chi-square test [9] was conducted to assess the association between sites of pain and the presence of *grahanidosha*. The analysis revealed no statistically significant association between *grahanidosha* and isolated neck pain (χ^2 = 0.751, p = 0.386) or low back pain (χ^2 = 1.133, p = 0.287). Patients with neck and upper back pain exhibited a chi-square value of 8.362 (*P* = 0.004), indicating a statistically significant association. Similarly, individuals with both neck and low back pain showed a chi-square value of 4.756 (*P* = 0.029), which was also statistically significant. No significant association was found for upper back and low back pain (chi-square = 0.000, *P* = 0.991) or for pain in the neck,

upper back, and low back (chi-square = 1.739, *P* = 0.187) **(Table 5).**

Table 5 - Chi-Square Analysis of *Grahanidosha* by Site of Pain

Site of pain	Chi square Value	Df	Asymptotic Significance (2-sided)
Neck pain	0.751	1	0.386
Low back pain	1.133	1	0.287
Neck and upper back	8.362	1	0.004
Neck and low back	4.756	1	0.029
Upper back and low back	0.000	1	0.991
Neck, upper and low back	1.739	1	0.187

- *Df- degree of freedom*

These results suggest a significant association between certain combinations of pain sites and the presence of *grahanidosha*. While these results indicate significant bivariate associations in certain pain distributions, no adjusted analyses or confidence intervals were computed; hence, the potential influence of confounding factors on these associations cannot be ruled out. Further analysis may provide deeper insights into these associations

Association of Specific *dosha* predominance with Site of Pain

The association between specific *doṣha* predominance and the site of pain was analysed using chi-square tests in categories with a higher number of patients. Among 164 patients, 31 exhibited *vataja grahanidosha*, but no significant association was found with neck and low back pain (OR: 0.59, 95% CI: 0.24–1.47). However, a significant association was observed between *pittaja grahanidosha* and neck and low back pain (χ^2 = 6.015, p = 0.014; OR: 2.88, 95% CI: 1.21–6.86). Similarly, *kapha-vataja grahanidosha* demonstrated a significant association with the same pain sites (χ^2 = 4.651, p = 0.031; OR: 2.82, 95% CI: 1.07–7.44). A particularly strong and statistically significant association was noted between *vataja grahanidosha* and pain involving the neck, upper back, and low back (χ^2 = 11.185, p < 0.001; OR: 3.48, 95% CI: 1.14–10.62). In contrast, *vataja grahanidosha* did not show a significant association with low back pain alone (χ^2 = 0.054, p = 0.816; OR: 1.10, 95% CI: 0.50–2.41). These findings suggest that different *grahanidosha* subtypes may have varying degrees of association with specific pain patterns.

4. DISCUSSION

The relevance of this study lies in its exploration of the prevalence and implications of *grahanidosha* among patients suffering from chronic neck and back pain. Chronic pain in these regions is a widespread concern that greatly impacts individuals' quality of life and interferes with their daily activities and overall functioning. By focusing on the Ayurvedic concept of *grahanidosha*, this study provides a unique perspective on the potential underlying causes of chronic pain, which is often not addressed in conventional medicine. The tool developed and used for this survey is characterized by its comprehensive approach to evaluate the presence of *grahanidosha* and its association with specific pain sites.

The demographic characteristics of the study population provided valuable insights into the profile of patients

seeking treatment for chronic neck and back pain within the context of Ayurveda. The distribution across age and gender categories reflects a diverse representation, which is essential for understanding the prevalence and characteristics of *grahanidosha* in this population. With regards to the age, the predominance of patients aged 31-40 years (45%) and 41-45 years (41%) underscores the significance of chronic neck and back pain in the adult population, particularly during the middle-aged years. This age distribution aligns with previous research indicating that middle-aged individuals are more susceptible to musculoskeletal disorders,[10] including chronic pain in the neck and back regions. The relatively smaller proportion of patients aged 20-30 years (12%) suggests that chronic neck and back pain may become more prevalent with advancing age, highlighting the importance of early intervention and preventive measures. The chronicity of pain further underscores the long-term impact of chronic neck and back pain on patients' well-being.[11]

The study findings indicate a higher prevalence of *grahanidosha* across most categories of chronic spinal pain. Notably, *grahanidosha* was more frequently observed in patients with low back pain and in those with combined pain involving the neck and lower back. In contrast, a comparatively smaller proportion of patients with isolated neck pain or upper back pain exhibited features of *grahanidosha*, with a higher representation of individuals having samagni in these groups. This distribution suggests that deranged agni is more commonly associated with lower spinal pain syndromes and multi-site involvement.

The chi-square tests provided further insights into the specific associations between different *dosha* predominance and pain sites. *Vataja grahanidosha* did not show a significant association with neck and low back pain. However, significant associations were found between *pittaja grahanidosha* and neck and low back pain, as well as between *kapha-vataja grahanidosha* and neck and low back pain. Additionally, *vataja grahanidosha* was significantly associated with pain in the neck, upper back, and low back regions, though not with low back pain alone.

These findings underscore the importance of assessing the presence of *grahanidosha* along with the *dosha* predominance in managing chronic neck and back pain. *Grahanidosha* can lead to the formation of *ama*, a toxic byproduct of improper digestion and metabolism, which can accumulate and contribute to various pain pathologies.[12] Thus, in treating chronic pain conditions in Ayurveda, it is crucial to assess and address both *grahanidosha* and the resultant *ama*. This Ayurvedic perspective resonates with emerging biomedical insights into the gut-brain axis, where disrupted gastrointestinal function and microbial imbalance contribute to systemic inflammation and chronic pain syndromes. The notable presence of *grahanidosha* in patients with neck, upper back, and lower back pain may reflect this systemic involvement, aligning with modern theories linking gastrointestinal dysfunction to chronic musculoskeletal pain. Recent

studies have shown that gastrointestinal dysfunction is frequently associated with chronic musculoskeletal pain, particularly in overlapping syndromes like fibromyalgia and irritable bowel syndrome (IBS).[13] These conditions are understood to involve central sensitisation, altered gut microbiota, and dysregulated neuroimmune communication along the enteric and central nervous systems.[14] Thus, the Ayurvedic concept of *grahanidosha*, traditionally attributed to impaired digestive and metabolic function, may represent a parallel understanding of systemic dysregulation contributing to chronic pain syndromes. This convergence of perspectives supports the relevance of assessing *agni* status in patients with chronic pain and highlights the potential for integrative approaches to management.

This study has certain limitations that need to be considered while interpreting the findings. As a cross-sectional study, it does not establish the temporal relationship between *grahanidosha* and pain, making it unclear whether digestive imbalances preceded the onset of pain or vice versa. Additionally, although efforts were made to exclude patients with pain due to trauma and structural pathologies such as intervertebral disc prolapse (IVDP) or spondylosis by restricting the age group to 20–45 years, some individuals with these conditions may have been inadvertently included. This could introduce potential confounding in the observed associations. Although efforts were made to control major confounding variables through the study design, the cross-sectional nature of the study and the use of chi-square tests without adjusted regression models meant that no confidence intervals or multivariate adjustments were performed, limiting the ability to account for potential confounding effects. Nonetheless, from an Ayurvedic perspective, the assessment of *agni* is a key factor in evaluating chronic pain, irrespective of the underlying modern medical diagnosis, reinforcing the relevance of exploring digestive health in these patients.

In conclusion, this study underscores the potential of Ayurvedic diagnostics and treatment approaches in managing chronic neck and back pain by identifying and targeting *grahanidosha*. The survey revealed notable variations in the prevalence of *grahanidosha* across different pain categories, demonstrating the clinical relevance of the diagnostic tool in identifying *dosha* imbalances. Significant associations were found between *grahanidosha* and pain in the neck and upper back, as well as between the neck and lower back, highlighting the importance of addressing *grahanidosha* in these patients. Understanding the complex interplay between *grahanidosha* and pain manifestation can pave the way for more personalized and effective treatment approaches, ultimately enhancing patient outcomes. The findings also emphasize the need for further research to explore the clinical efficacy of integrating Ayurvedic principles with conventional pain management practices and to develop *agni*-specific treatment strategies for optimal pain relief and overall health improvement.

Generalisability of the findings: While this study provides important insights into the relationship between *grahanidosha* and chronic spinal pain, its generalisability is influenced by several factors. The study was conducted in a single tertiary-level Ayurvedic institution and included a relatively narrow age group (20–45 years), excluding patients with known structural spinal disorders and post-traumatic pain. As a result, the applicability of findings to older populations, those with degenerative or trauma-induced conditions, or patients from different cultural and dietary backgrounds may be limited. Furthermore, the diagnostic construct of *grahanidosha*, although deeply rooted in Ayurvedic theory, is yet to be fully explored in the context of other chronic pain conditions such as osteoarthritis or fibromyalgia. Expanding this line of research could help determine whether *grahanidosha* plays a common pathogenic role in chronic pain beyond axial skeletal presentations.

Moreover, due to the cross-sectional nature of the study, the temporal relationship between *grahanidosha* and pain could not be established. It remains unclear whether impaired *agni* and the formation of ama precede the onset of musculoskeletal pain or if chronic pain leads secondarily to *agni* dysfunction through mechanisms such as reduced physical activity, altered dietary habits, or psychological stress. This uncertainty in the temporality warrants longitudinal studies to understand the directionality between *grahaṇi* dysfunction and chronic pain. Such studies may augment the conceptual models of pathogenesis elucidated in Ayurveda and further strengthen the rationale for *agni*-focused interventions in the management of chronic pain.

Future Directions: To enhance the generalisability and clinical applicability of the present findings, future studies should aim to validate these results in larger, multi-center cohorts. Longitudinal research is essential to clarify the temporal relationship and potential bidirectional dynamics between *grahanidosha* and chronic pain. Additionally, well-designed interventional trials focusing on addressing the *agni* dysfunction could provide valuable insights into their role in modulating pain intensity and improving digestive health. Such investigations would strengthen the evidence base for integrating Ayurvedic diagnostic and therapeutic frameworks into chronic pain management.

Ethical Approval

The study received ethical clearance from the Institutional Review Board, VPSV Ayurveda College, Kottakkal with approval number: IRB/CL/PhD/02/23, dated 04.03.2023/ reference: IRB/Doc/PhD/02/23, dated 01.03.2023. The study adhered to the principles outlined in the Declaration of Helsinki. All data collected were kept confidential and used solely for research purposes, ensuring the privacy and anonymity of participants.

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Final Approval of the Manuscript: All authors

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