AN ASSESSMENT OF ROLE OF AGNI IN PANDU ROGA AND ITS UPSHAYATMAKA PARIKSHANA WITH DARVYADI LAUHA: A CASE STUDY

Dr. Monika[1]*, Dr. Avadhesh Kumar[2], Dr. Ram Milan[3] and Dr. Jitendra Kumar[4]

[1]Junior Resident, Department of Roga Nidana Evum Vikriti Vigyana.
[2]Professor & H.O.D., Department of Roga Nidana Evum Vikriti Vigyana.
[3]Associate Professor, Department of Dravya Guna.
[4]Assistant Professor, Department of Rachana Sharir.

*Corresponding Author: Dr. Monika

Junior Resident (Department of Roga Nidana Evum Vikriti Vigyana).

ABSTRACT

Global health faces significant challenges today, with the fast-paced modern lifestyle leading to increased stress and dietary habits that favour convenience over nutrition. This shift has resulted in the rise of diet-related and stress-induced disorders. According to Ayurveda, many of these issues stem from improper diet and lifestyle choices, leading to *Agni dushti* and subsequent digestive disorders. *Pandu*, a disease of *Rasavaha srotasa*, can be linked to anaemia (*Rakta alpata*), a pressing global health concern. While modern medicine offers various treatments for anaemia, many of these cause gastrointestinal side effects, often exacerbating the patient's condition. Additionally, poor digestion hinders the absorption of nutrients, contributing to nutritional deficiencies despite supplementation. In response, there is a growing need for natural, effective treatments. The current study aims to explore the role of *Agni* and the *Upshayatmaka* (therapeutic) effect of *Darvyadi Lauha* in managing *Pandu Roga*, as disturbed *Agni* is a key factor in many diseases.

KEYWORDS: *Agni dushti, Pandu, Rakta alpata, Rasavaha Srotasa.*

INTRODUCTION

Ayurveda, the ancient science of life, offers a comprehensive and holistic approach to health and well-being. It teaches the art of living in harmony with nature by balancing the body, mind, and spirit. Over centuries, Ayurveda has continuously evolved through research and adaptation, ensuring its relevance in addressing modern health challenges. Its core principles, established millennia ago, remain profoundly relevant today for disease prevention and health promotion,

"प्रयोजनं चास्य स्वस्थस्य स्वास्थ्यरक्षणमातुरस्य विकारप्रशमनं च।।" (Ch.Su.30/26)

In today's fast-paced world, human health is declining due to lifestyle choices driven by stress, poor dietary habits, and lack of proper nutrition. Many individuals, particularly in urban settings, rely on fast, processed foods that lack essential nutrients. Simultaneously, a significant portion of the population, particularly those living below the poverty line, faces malnutrition due to limited access to nutritious food and inadequate living conditions. This dual burden; poor dietary habits and malnutrition contribute to widespread health issues across all economic classes.

Among the many health issues arising from this nutritional imbalance, one of the most significant is anaemia. It is prevalent worldwide, especially in developing countries, where malnutrition, parasitic infections, and inadequate healthcare systems exacerbate the problem. While modern medicine offers effective treatments for acute anaemia, it often struggles with chronic cases, which are linked to deeper metabolic dysfunctions. These chronic conditions require a more holistic approach, one that addresses not only the symptoms but also the root causes, such as impaired digestion and nutrient absorption.

In Ayurveda, *Rakta* (blood) is regarded as a vital component for *Jeevana* (life), *Dharana* (maintenance), and *Poshana* (nourishment) of the body. *Acharya Sushruta*, emphasised the importance of preserving *Rakta* for health maintenance, stating:

देहस्य रुधिरं मूलं रुधिरेणैव धार्यते।

तस्मादयत्नेन संरक्ष्यं रक्तं जीव इति स्थिति:।। (Su.Su.14/44)

Pandu Roga is closely correlated with anaemia due to its similar signs and symptoms, such as pallor, fatigue, and weakness, The present study focuses on understanding the role of *Agni* in the etiopathogenesis of *Pandu Roga* and exploring the efficacy of *Darvyadi Lauha*, an Ayurvedic formulation, in managing this condition. With anaemia affecting nearly 30% of the global population, and more than half of the anaemic women residing in the Indian subcontinent, it is imperative to explore alternative treatment approaches that go beyond symptomatic relief, addressing the underlying causes of nutrient deficiencies and malabsorption.

NEED FOR THIS RESEARCH WORK

Pandu Roga, correlating with anaemia, is a widespread global health concern, particularly affecting vulnerable groups such as women and children. This condition leads to various health challenges, including fatigue, cognitive decline, and reduced physical performance, highlighting an urgent need for more effective, holistic treatment approaches. Although modern supplements and medications are effective in targeting haemoglobin deficiency (*Rakta Alpata*), they often cause adverse effects such as nausea, diarrhoea, and stomach irritation. Furthermore, many patients experience limited benefits due to underlying digestive issues, resulting in poor nutrient absorption and persistent deficiencies. In Ayurveda, *Agni* is central to digestion, absorption, and assimilation, and its impairment (*Agnimandya*) is regarded as the root cause of various diseases, including *Pandu Roga*. When *Agni* is disrupted, it leads to inadequate nourishment of the *Rasa* and *Rakta Dhatu*, contributing to the development of *Pandu Roga*. Unlike modern medicines, which primarily focus on replenishing iron levels, Ayurvedic treatments address the underlying disturbance in *Agni*, which is crucial for proper nutrient assimilation and overall health balance.

Therefore, this research aims to assess the role of *Agni* in the pathogenesis of *Pandu Roga* and evaluate the therapeutic effect of *Darvyadi Lauha*. The study will explore the efficacy of Ayurvedic treatment principles, particularly their potential to enhance digestive strength and nutrient absorption as a viable solution for managing anaemia. By emphasising the importance of *Agni*, this research seeks to present a holistic, side-effect-free alternative to conventional anaemia management, ultimately contributing to improved overall health and long-term wellness.

WHY DARVYADI LAUHA IS SELECTED?

दार्वी सत्रिफला व्योषविडङ्गान्ययसो रज: ।

मधुसर्पियुतं लिह्यात् कामलापाण्डुरोगवान् ॥   (*Chakrdutta Chi.8/29*)

Among the many formulations described in Ayurvedic texts, *Darvyadi Lauha*, detailed in the *Chakradutta Pandu Roga Chikitsa Prakaran* (8/29), has been selected for this study. This formulation contains *Daruharidra, Haritaki, Vibhitaki, Amalaki, Shunthi, Maricha, Pippali, Vidanga,* and *Lauh Bhasma* as key ingredients. The

majority of these drugs possess *Deepana* and *Pachana* properties, which normalise *Jatharagni* and *Dhatvagni*, ensuring the uninterrupted process of *Dhatu* formation. Since *Mandagni* is considered a primary cause of various diseases, including *Pandu Roga*, the formulation's ingredients like *Daruharidra* and *Trikatu* are particularly noteworthy. These drugs are well-known for their ability to enhance *Agni*, which is essential for breaking the pathogenesis of *Pandu Roga* effectively.

AIMS AND OBJECTIVES OF THE STUDY
- ➢ To assess the role of *Agni* in the etiopathogenesis of *Pandu Roga.*
- ➢ To evaluate the etiopathogenesis of *Pandu Roga.*
- ➢ To assess the therapeutic efficacy (*Upshayatmaka Parikshana)* of *'Darvyadi Lauha'* in the management of *Pandu Roga.*
- ➢ To conduct a detailed clinical evaluation of the aetiology, types, signs, and symptoms of *Pandu Roga* (anaemia), correlating Ayurvedic descriptions with modern clinical presentations.

HYPOTHESIS
Null Hypothesis (H$_0$)-There is no significant role of *Agni* in the pathogenesis of *Pandu Roga*, and *Darvyadi Lauha* has no significant effect on *Pandu Roga.*

Alternate Hypothesis (H$_1$)-There is a significant role of *Agni* in the pathogenesis of *Pandu Roga,* and *Darvyadi Lauha* has a significant effect on *Pandu Roga*.

PLAN OF STUDY
- ➢ Conceptual study
- ➢ Clinical study
- ➢ Discussion
- ➢ Summary
- ➢ Conclusion

CONCEPTUAL STUDY
Historical review
In this part, a historical review of *Pandu Roga* was collected from the classical text of Ayurveda, previous research work done, scientific journals, periodic magazines, monographs and other available sources. Similarly modern reviews regarding Anaemia have been gathered from the Modern Texts and various other online media. After thorough analysis, the data has been gathered and compiled in an organized manner.

Disease review: This section includes a detailed description of *Pandu* as well as anaemia from both the Ayurvedic point as well as Modern point of view.

Drug review: Includes a brief description of the drugs in *Darvyadi Lauha*.

CLINICAL STUDY - MATERIAL AND METHOD
- • **Source of data-** In this study, 60 patients of the *Pandu* were registered from OPD and IPD of *Roga Nidana Evum Vikriti Vigyana* and other departments

of Government Ayurvedic P.G. College and Hospital Varanasi. The selection of patients has been done based on clinical features and laboratory investigations have sustained diagnosis.

- **Method of collection of data-** A total of 60 patients were selected fulfilling the inclusion criteria from OPD and IPD of Government P.G Ayurvedic College and Hospital Varanasi, and a special proforma was made with details of history taking, and physical signs- symptoms as mentioned in our classics and allied science. All Patients were assessed before, during and after the trial based on the designed proforma. *Upshayatmaka Parikshana* was carried out using the trial drug *Darvyadi Lauha*. In this trial, 3 grams of *Darvyadi Lauha Churna* was given daily to the patient in two divided doses Preferably before the meal, with *Madhu* and *Ghrita* (in unequall quantity).

INCLUSION CRITERIA
1. Patients will be selected irrespective of their sex, occupation, religion, caste, etc.
2. Patient with signs and symptoms of *Pandu Roga* (anaemia).
3. Patient of age group between 16-70 yrs.
4. Blood sample having Hb 6.5 gm% to 11 gm%.
5. Patient having a low level of RBC count, PCV, MCV, MCH, MCHC.
6. Marital status – Married and unmarried both.

EXCLUSION CRITERIA
1. Patients below 16 years and above 70 years.
2. Blood sample having Hb % less than 6.5 gm%.
3. Any haemorrhagic disorder or hereditary condition like Thalassemia, Sickle cell anaemia, Leukaemia, Aplastic anaemia, anaemia due to bleeding piles, Menorrhagia, etc.
4. Patient having any other major complicated disease like Cardiac disease, Leukaemia, Chronic renal disease, etc.
5. Patients having any congenital anomaly.
6. Mentally Retarded and psychologically ill person.
7. Pregnant woman.

ASSESSMENT CRITERIA
Assessment of the patient was done based on the following aspects;
A. ETIOLOGICAL FACTORS: As per *Ayurvedic* texts.
Based on etiological factors at the time of admission

NIDANA (*HETU)*	+ or -
AHARAJA NIDAN- . *Virudh Aahara, Asatmya bhojana, Viddagdha Anna* . Excessive intake of *kshar*, sour, saline, hot, *nishpava, masha, pinyak & tila taila.* **.** *Mrid bhakshanam*	
VIHARAJ NIDAN- . *Ativyayama* . *Ativyavaya* . *Diwasvapna* . *Vega vidharana*	
MANSIK NIDAN- . *Kama, chinta, bhaya, krodha, shoka***.**	

SUBJECTIVE CRITERIA: Based on signs and symptoms.

CARDINAL SYMPTOMS
1. PANDUTA (Pallor)

Grading	
0	No pallor
1	In any two of these
2	In any three of these
3	In any four of these
4	Present in all five parts

2. DAURBALYA (GENERAL WEAKNESS)

0	No *daurbalya*
1	Not able to perform strenuous activity.
2	Not able to perform moderate activity.
3	Can not perform moderate activity but can perform mild activity without any difficulty.
4	Even mild activities can not be performed.

3. RUKSHATA (DRYNESS)

0	No line on scrubbing with nail.
1	Faint line on scrubbing by nail.
2	Lining and even words can be written by nail.
3	Excessive *Rukshata* leading to *kandu*.
4	Dryness/roughness and criss-cross visible cracking of the skin.

4. PINDIKO-DWESHTANA (LEG CRAMPS)

0	Absent
1	Occurs only during heavy work like exercise, running, climbing upstairs, lifting heavy objects etc.
2	Occurs during normal routine light works like walking etc.
3	Occurs continuously throughout the day but relieves after the rest.
4	Occurs even during the resting condition.

5. AAYASEN SHWAS

0	Not present
1	After heavy work, relieved soon & tolerated
2	After moderate work, relieved later & tolerated
3	After a little work but relieved later & up to tolerance
4	*Shwas* even in resting condition

ASSOCIATED SYMPTOMS

6. *Nidraluta*

0	Normal sleep 6-7 hrs. per day
1	Sleep up to 8 hrs./day with *Anga Gaurava*
2	Sleep up to 8 hrs./day with *Anga Gaurava* and *Jrimbha*
3	Sleep up to 10 hrs./day with *Tandra*
4	Sleep more than 10 hrs./day with *Tandra* and *Klama*

7. *Gaurav*

0	No heaviness
1	Occasionally feeling of heaviness for sometimes in hands and feet
2	A feeling of heaviness sometimes in hands and feet not affecting activities of daily living
3	A feeling of heaviness sometimes in hands and feet affecting activities of daily living
4	Whole body for the most of the day

8. *Parshva shiroruka*

0	No pain
1	Occasional pain 1 to 2 times/week
2	Pain 3 to 5 times/week
3	Pain more than 5 times/week
4	Continuous pain

9. *Aasya-Vairasya*

0	Normal taste of mouth
1	Occasional sensation of unpleasant taste
2	A Continuous sensation of unpleasant taste that vanishes after eating something
3	A Continuous mild sensation of unpleasant taste persists even after eating
4	Severe unpleasant taste throughout the day

10. *Kopana* (Irritability)

0	No anger even for reasonable cause
1	Gets angry only for reasonable cause
2	Gets angry even for unreasonable cause
3	Highly irritable for no cause
4	Uncontrollable anger with body gestures

11. *Bhrama* **(Dizziness)**

0	No Reeling of head/ *Bhrama*
1	Sometimes feeling of reeling head/ *Bhrama*
2	The feeling of reeling head/ *Bhrama* < 3 times a day
3	The feeling of reeling head/ *Bhrama* > 3 times a day
4	Frequently feeling of reeling head change of posture causes severe problem

12. *Jwara* **(Fever)**

0	No
1	Occasional
2	Once a week.
3	Daily once
4	Constant

13. *Sadana* **(Fatigue)**

0	No fatigue
1	Mild fatigue on doing routine work.
2	Moderate fatigue on doing routine work.
3	Excessive fatigue on doing routine work.
4	Excessive fatigue even on doing little work.

BASED ON AGNI BALA
1) JARAN SHAKTI (DIGESTIVE POWER)
I. *Udgarshuddhi* **(Clear belching)**

0	2-3 hours after meal
1	3-4 hours after meal
2	4-6 hours after meal
3	No feeling of *Udgarshuddhi* till the next meal

II. *Utsaha* **(Enthusiasm)**

0	Active for daily routine work within an hour after the meal
1	Active enough for light work within an hour after the meal
2	Unable to perform light work and need to sleep
3	Discomfort in every position

III. *Vegotsarga* **(Proper evacuation of bowel)**

0	At proper time and without any difficulty
1	At proper time but with extra effort
2	Not in proper time, without extra effort
3	Not in proper time but with extra effort

IV. *Laghuta* **(lightness of the body)**

0	Feeling of *Laghuta* within 6-8 hours after food
1	Feeling of *Laghuta* within 8-10 hours after food
2	Feeling of *Laghuta* within 10-12 hours after food
3	No particular feeling of *dehalaghava* in a whole day

V. *Kshudha* **(Hunger)**

0	In 6-8 hours after meal
1	In 8-10 hours after meal
2	In 10-12 hours after meal
3	<12 hours after meal

VI. *Trishna Pravritti* **(Thirst)**

0	In 4 hours after a meal
1	In 6 hours after meal
2	In 8 hours after meal
3	>8 hours after meal

Score	*Jaranashakti*
0-6	*Pravara*
7-12	*Madhyama*
13-18	*Avara*

2) ABHYAVAHARANA SHAKTI (CAPACITY TO EAT)

0	Taking food in a proper quantity thrice a day
1	Taking food in a smaller quantity thrice a day
2	Taking food in proper quantity twice a day
3	Taking food in less quantity twice a day
4	Taking food in proper quantity once a day
5	Taking food in less quantity once a day
6	The person can not take food at all

Score	*Abhyavaharana Shakti*
0-1	*Pravara*
2-3	*Madhyama*
4 or more	*Avara*

3) RUCHI (APPETITE)

0	Equally willing towards all the *bhojya padartha*
1	Willing towards some specific *Aahara/Rasavisesha*
2	Willing towards only the most liked foods not the other
3	Unwilling for food but could take the meal
4	Unwilling, and can not take a meal

OBJECTIVE CRITERIA
LABORATORY INVESTIGATIONS
A. For Clinical Trial

S. No.	PARAMETER	B.T	A.T
1.	Hb		
2.	RBC count		
3.	TLC		
4.	PCV		
5.	MCV		
6.	MCH		
7.	MCHC		
8.	ESR		
9.	GBP/PBS		

B. For Exclusion of the Patients
I. Blood urea
II. Serum creatinine

ASSESSMENT OF OVERALL EFFECT OF THERAPY

S.NO.	EFFECTS	PERCENTAGE OF RELIEF
1.	Marked improvement	>75% relief in signs and symptoms
2.	Moderate improvement	51-75% relief in signs and symptoms
3.	Mild improvement	25-50% relief in signs and symptoms
4.	No improvement	<25% relief in signs and symptoms

OBSERVATION AND RESULT
DISTRIBUTION OF CASES ACCORDING TO AGE (N=60)
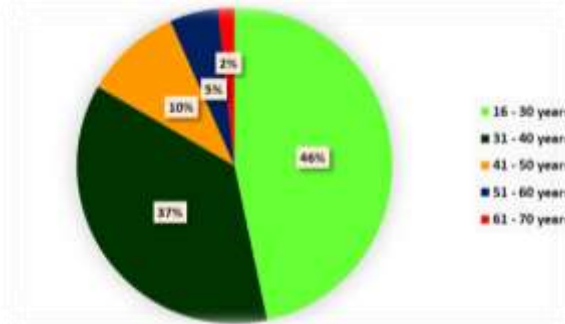
The majority were between 16 and 30, accounting for 46.7%. This was followed by individuals aged 31 to 40, who made up 36.7%. A smaller proportion of the subjects fell within the age ranges of 41 to 50 (10.0%), 51 to 60 (5.0%), and 61 to 70 (1.7%).

DISTRIBUTION OF CASES ACCORDING TO GENDER
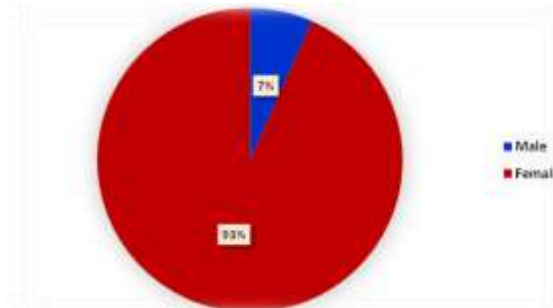
The study population comprised predominantly female participants (93.3%), with only a small percentage of males (6.7%).

DISTRIBUTION OF CASES ACCORDING TO RELIGION
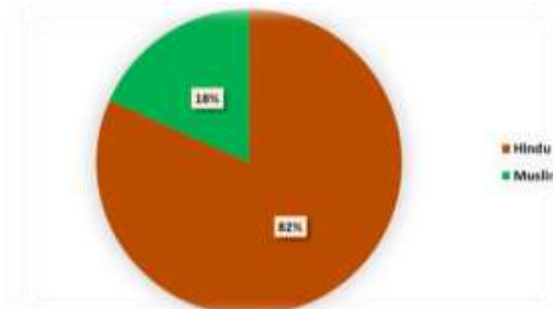
The majority, 81.7%, were Hindu, while 18.3% identified as Muslim.

DISTRIBUTION OF CASES ACCORDING TO MARITAL STATUS
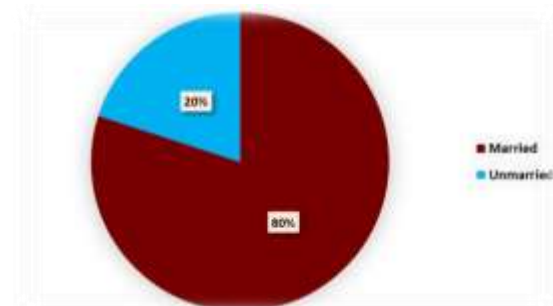
The marital status of the subjects revealed that 80.0% were married, while 20.0% were unmarried.

DISTRIBUTION OF CASES ACCORDING TO OCCUPATION
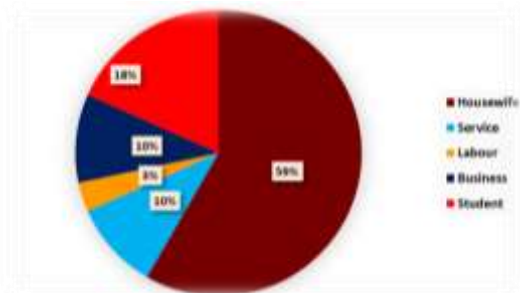
The majority, 58.3%, were housewives. Students made up 18.3% of the group, while 10.0% were involved in service-related jobs, and another 10.0% were engaged in business. A smaller proportion, 3.3%, worked as labourers.

DISTRIBUTION OF CASES ACCORDING TO EDUCATION
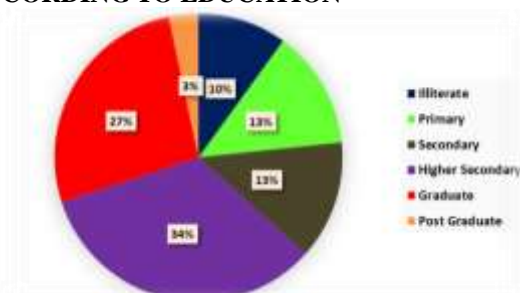
A significant portion, 33.3%, had completed higher secondary education, followed by 26.7% who were graduates. Those with secondary and primary education each constituted 13.3% of the group. A smaller percentage, 10.0%, were illiterate, while 3.3% had attained postgraduate education.

DISTRIBUTION OF CASES ACCORDING TO SOCIO-ECONOMIC STATUS
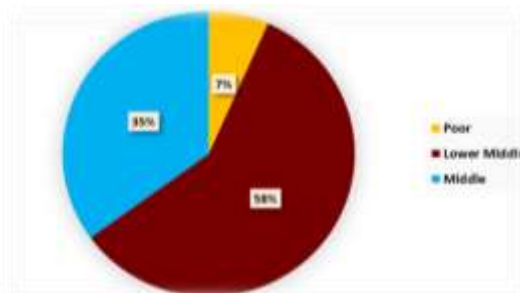
The majority, 58.3%, belonged to the lower middle class. This is followed by 35.0% classified as middle class. A small portion, 6.7%, fell into the poor category, while no participants were in the upper middle or rich categories.

DISTRIBUTION OF CASES ACCORDING TO DIET AND ADDICTION
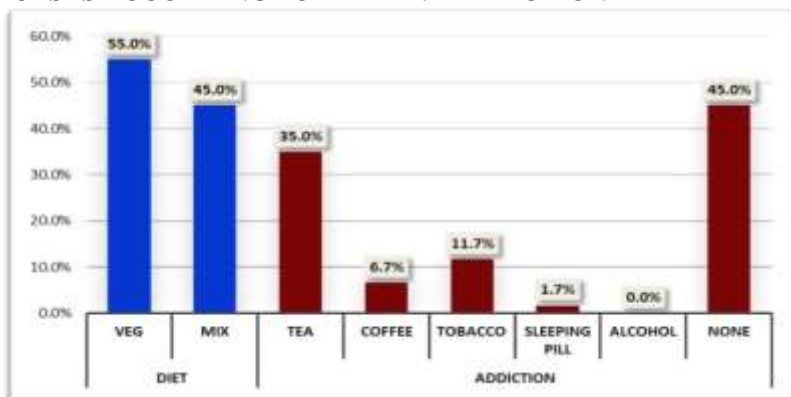
55.0% of participants were vegetarian, while 45.0% were habituated to a mixed non-vegetarian diet. Regarding addictions, 35.0% of participants were addicted to tea, 6.7% to coffee, 11.7% currently use tobacco, and 1.7% were taking sleeping pills. No participants reported alcohol use, and 45.0% had no addictions.

DISTRIBUTION OF CASES ACCORDING TO HABITAT
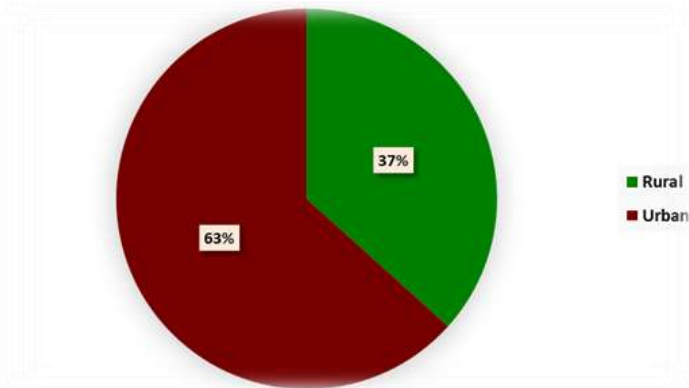
The majority of participants, 63.3%, resided in urban areas, while 36.7% came from rural areas.

DISTRIBUTION OF CASES ACCORDING TO *RASA PRADHANATA*
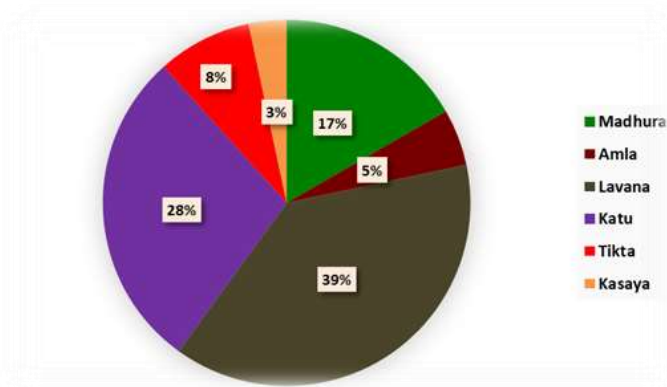
The majority, 38.3%, favoured *Lavana* (salty) *Rasa Pradhana Ahara*. This was followed by *Katu* (pungent) at 28.3% and *Madhura* (sweet) at 16.7%. *Tikta* (bitter) and *Amla* (sour) were less preferred, with 8.3% and 5.0%, respectively, while *Kashaya* (astringent) was the least favoured, accounting for 3.3% of the participants.

DISTRIBUTION OF CASES ACCORDING TO *AGNI*
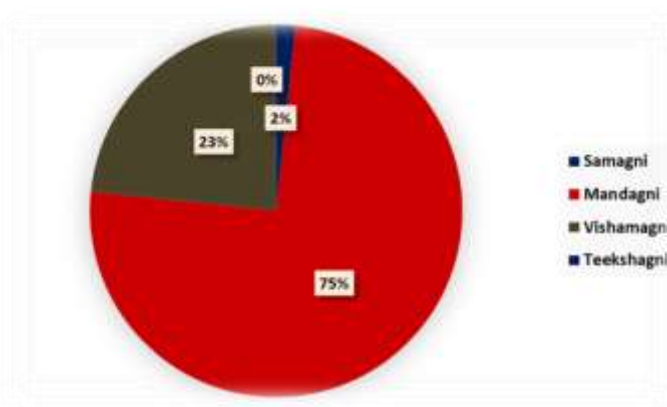
The majority, 75.0%, had *Mandagni*. A notable 23.3% exhibited *Vishamagni*, while only 1.7% of the subjects had *Samagni*. No subjects were reported to have *Teekshagni*.

DISTRIBUTION OF CASES ACCORDING TO *KOSHTHA*
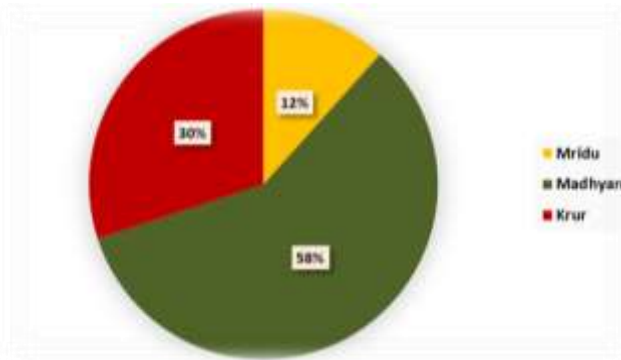
The majority were of *Madhyam kostha*, comprising 58.3%. 30.0% were of *Krur Kostha* and 11.7% were of *Mridu Kostha*.

DISTRIBUTION OF CASES ACCORDING TO URINE, SLEEP AND BOWEL HABITS
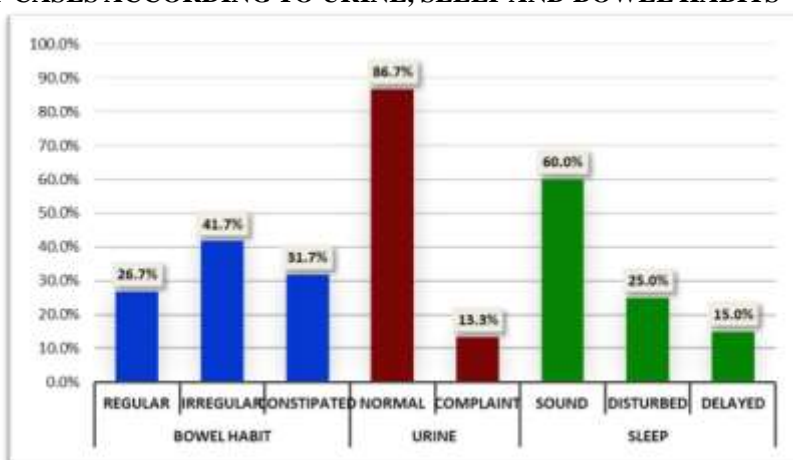
Regarding bowel habits, 26.7% of participants had regular bowel movements, 41.7% experienced irregularity, and 31.7% reported constipation. In terms of urinary function, 86.7% of participants reported normal function, while 13.3% reported complaints. Concerning sleep patterns, 60.0% of participants experienced sound sleep, 25.0% reported disturbed sleep, and 15.0% had difficulty falling asleep.

DISTRIBUTION OF CASES ACCORDING TO MENSTRUAL HISTORY
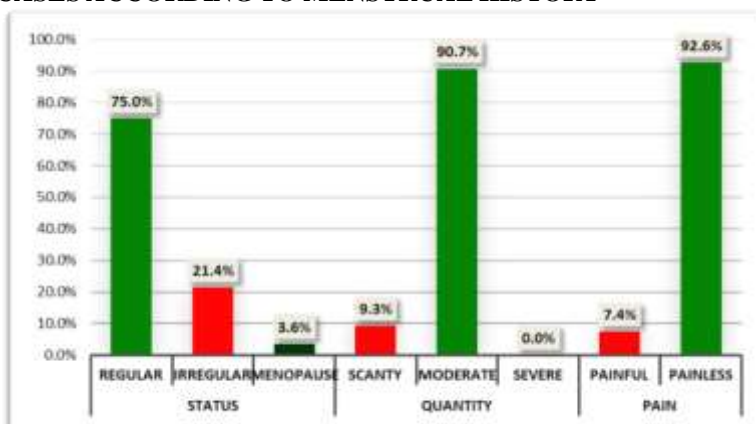
The majority of the participants (75.0%) reported having a regular menstrual cycle, while 21.4% experienced irregular cycles, and 3.6% were in menopause. Regarding the quantity of menstrual flow, 90.7% reported a moderate flow, 9.3% had a scanty flow, and none experienced a severe flow. When considering menstrual pain, only 7.4% reported experiencing painful periods, while the remaining 92.6% described their periods as painless.
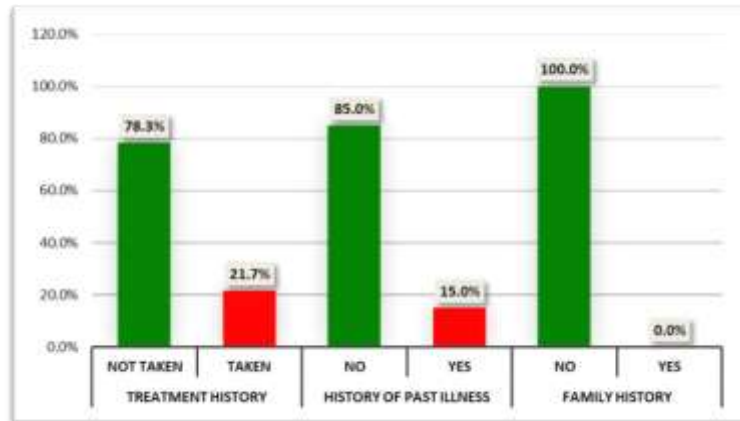
DISTRIBUTION OF CASES ACCORDING TO BUILD & NUTRITION
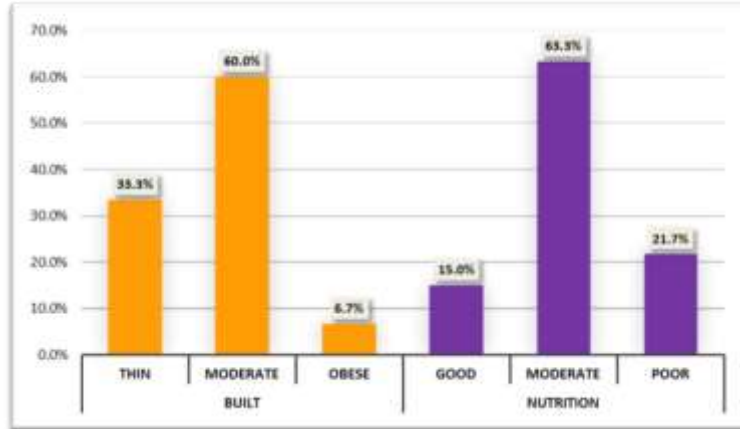
Regarding body composition, 33.3% of participants were classified as thin, 60.0% had a moderate build, and 6.7% were considered obese. Regarding nutritional status, 15.0% rated their nutrition as good, 63.3% as moderate, and 21.7% as poor.

DISTRIBUTION OF CASES ACCORDING TO TREATMENT HISTORY

The treatment history among participants revealed that a significant majority, 78.3%, have not received treatment, while 21.7% have. Regarding the history of past illnesses, 85.0% reported no previous illnesses, whereas 15.0% have a history. In terms of family history, 100% of participants reported no family history of the condition under study.

ETIOLOGICAL FACTORS
DISTRIBUTION OF CASES ACCORDING TO *AHARAJ NIDANA*
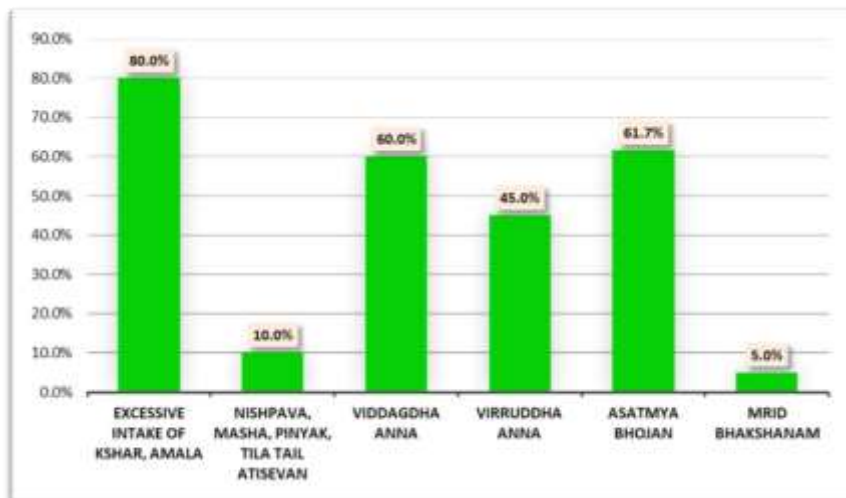
Excessive intake of *Kshar* and *Amala* was reported by 48 individuals (80.0%). Consumption of *Nishpava, Masha, Pinyak*, and *Tila Tail* was noted in 6 individuals (10.0%). *Mrid Viddagdha Anna* was observed in 36 individuals (60.0%), while consumption of *Virruddha Anna* was reported in 27 individuals (45.0%). *Asatmya Bhojan* was identified in 37 individuals (61.7%), and *Mrid Bhakshanam* was noted in 3 individuals (5.0%).
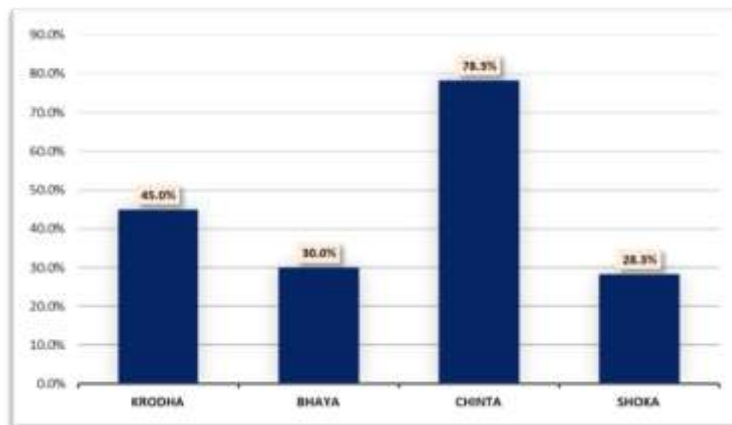
DISTRIBUTION OF CASES ACCORDING TO *VIHARAJ NIDANA*
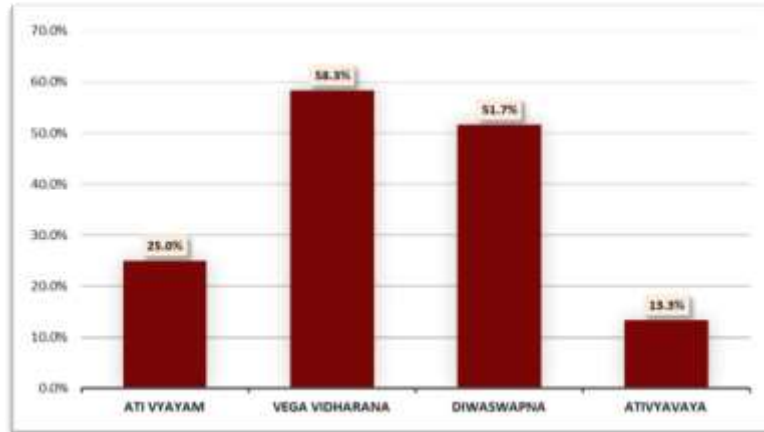
The distribution of *Viharaj Nidana* factors revealed that 15 individuals (25.0%) engaged in *Ati Vyayam*, 35 individuals (58.3%) practised *Vega Vidharana*, 31 individuals (51.7%) reported *Diwaswapna* and 8 individuals (13.3%) were involved in *Ativyavaya*.
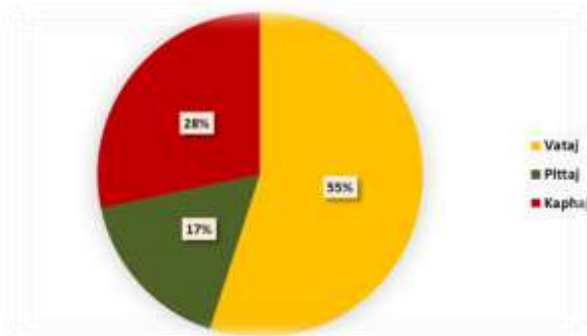
DISTRIBUTION OF CASES ACCORDING TO *MANSIK NIDANA*

The distribution of *Mansik Nidana* shows that 27 individuals (45.0%) experienced *Krodha*, 18 individuals (30.0%) were affected by *Bhaya*, 47 individuals (78.3%) reported *Chinta*, and 17 individuals (28.3%) experienced *Shoka*.

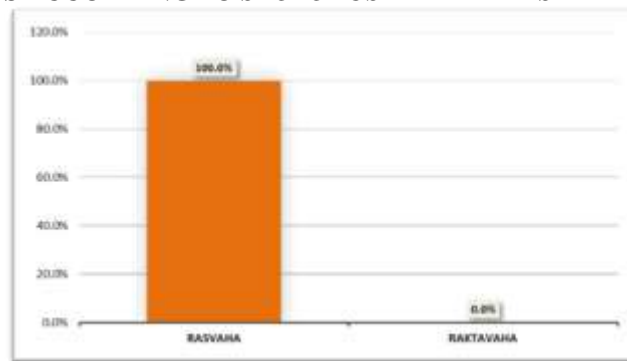**DISTRIBUTION OF CASES ACCORDING TO *PRADHANA DOSHA***

Vataj was the most prevalent, with 55.0% of the cases, followed by *Kaphaj* in 28.3%, and *Pittaj* in 16.7%.

DISTRIBUTION OF CASES ACCORDING TO *PRADHANA DUSHYA*
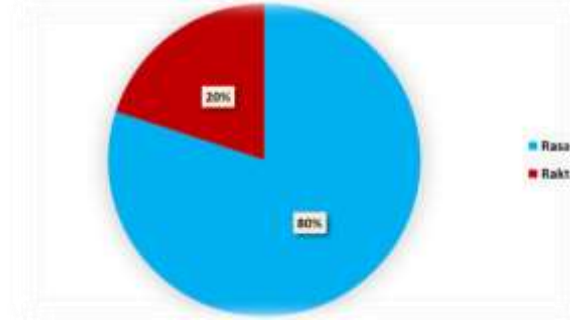
Rasa was found as *Pradhana Dushya* in 80.0% of cases, while *Rakta* was in 20.0% of the cases.
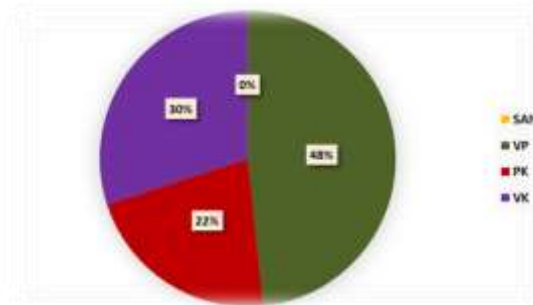
DISTRIBUTION OF CASES ACCORDING TO *SROTODUSHTI PAREEKSHA*

100% were classified under *Rasavaha Srotodushti* and nil under *Raktavaha*.
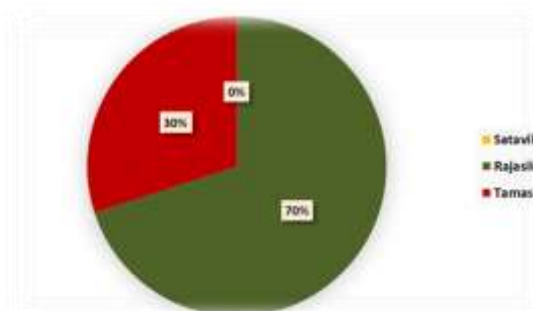
DASVIDHA PAREEKSHA
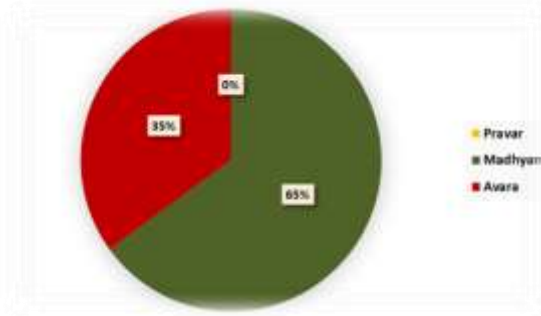## DISTRIBUTION OF CASES ACCORDING TO *SHARIRIK PRAKRITI*

48.3% had *Vata-Pitta*, 21.7% had *Pitta-Kapha*, and 30.0% had *Vata-Kapha Prakriti*. No participant had *Sama Prakriti*.

DISTRIBUTION OF CASES ACCORDING TO *MANSIK PRAKRITI*

70.0% were classified as *Rajasik* and 30.0% as *Tamasik*. No participants were classified as *Satvik*.

DISTRIBUTION OF CASES ACCORDING TO *SARA*

65.0% were of *Madhyam Sara* and 35.0% of *Avara*. No participants were of *Pravar Sara*.

DISTRIBUTION OF CASES ACCORDING TO *SAMHANANA*
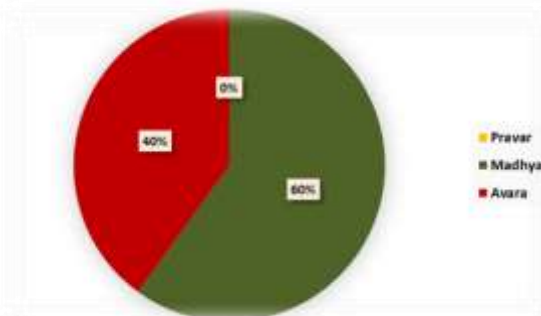
60.0% were categorized as *Madhyam* and 40.0% as *Avara*. No participants were categorized as *Pravar Samhananana*.

DISTRIBUTION OF CASES ACCORDING TO *PRAMANA*

66.7% were of *Madhyama Pramana* and 33.3% of *Heena*. No participants were of *Uttam Pramana*.

DISTRIBUTION OF CASES ACCORDING TO *SATVA*
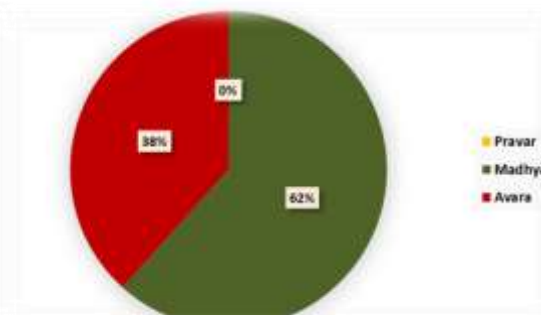
61.7% were of *Madhyama Satva*, and 38.3% were of *Avara*. No participants were of *Pravara Satva*.

DISTRIBUTION OF CASES ACCORDING TO *SATMYATA*
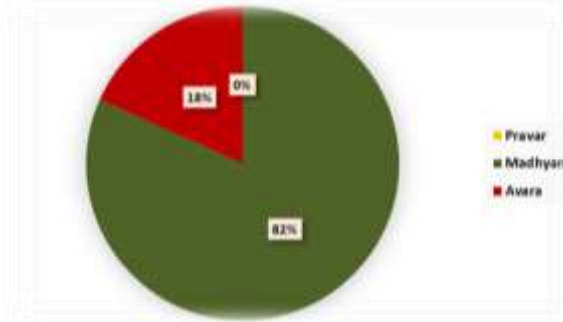
81.7% were categorized as *Madhyama Satmya* and 18.3% as *Avara*. No participants were categorized as *Pravara Satmya*.
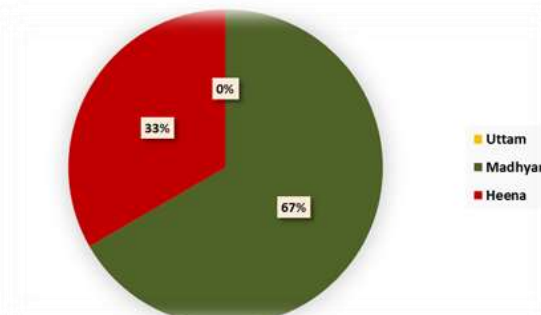
DISTRIBUTION OF CASES ACCORDING TO *VAYA*

98.3% were categorized as *Madhyama Vaya* and 1.7% as *Vridha*. No participants were categorized as *Bala*.

DISTRIBUTION OF CASES ACCORDING TO *VYAMAHA SHAKTI*
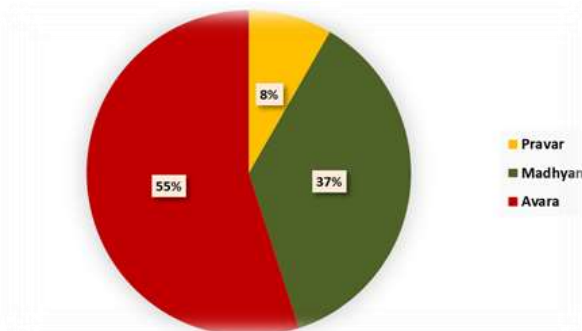
8.3% of individuals had *Pravar Vyayam Shakti*, 36.7% had *Madhyam*, and 55.0% had *Avara Vyayam Shakti.*

DISTRIBUTION OF CASES ACCORDING TO *JARAN SHAKTI*
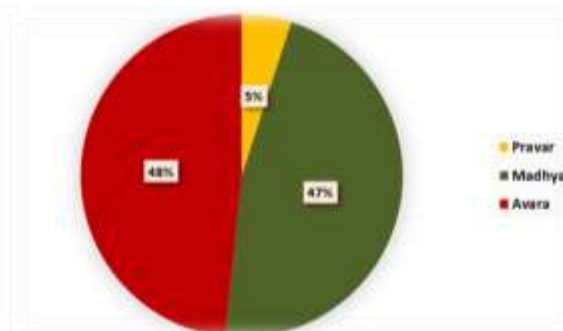
5.0% of individuals were categorized under *Pravar Jaran Shakti*, 46.7% under *Madhyam*, and 48.3% under *Avara Jaran Shakti*.

DISTRIBUTION OF CASES ACCORDING TO *ABHYAVAHARANA SHAKTI*
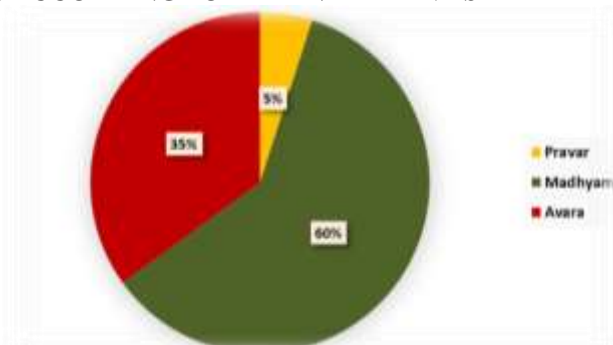
5.0% of individuals were categorised under *Pravar*, 60.0% under *Madhyam*, and 35.0% under *Avara Abhyavaharana Shakti*.

GENERAL EXAMINATION
DISTRIBUTION OF CASES ACCORDING TO GENERAL EXAMINATION
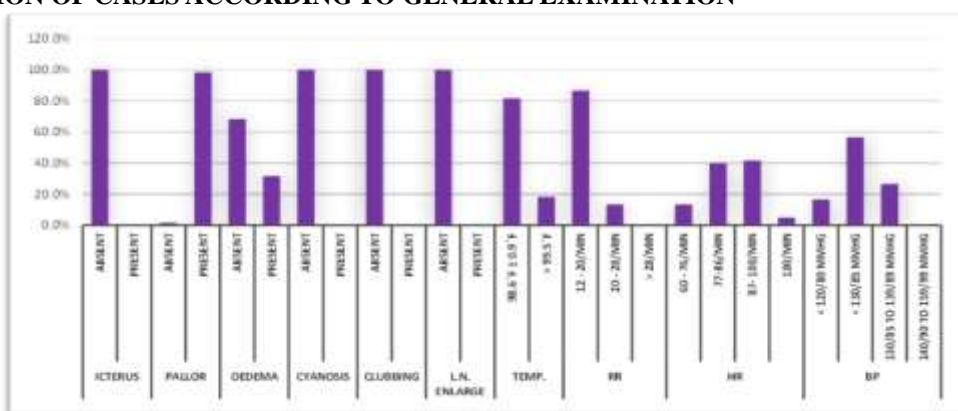
On the **general examination**
Icterus, cyanosis, clubbing, and lymph node enlargement were absent in all 60 individuals (100%).

Pallor was present in 98.3%, and oedema in 31.7% of individuals.

For vital signs
Temperature: 81.7% had a normal temperature, while 18.3% had a temperature above 99.5°F.

Respiratory rate: 86.7% had a rate of 12-20/min, and 13.3% had 20-28/min.

Heart rate: 40.0% had a rate of 77-86/min, 41.7% had 87-100/min, and 5.0% had a rate above 100/min.

Blood pressure: 16.7% had a BP below 120/80 mmHg, 56.7% had under 130/85 mmHg, and 26.7% had between 130/85 and 139/89 mmHg. In the general examination, the following findings were noted:

CARDINAL & ASSOCIATED SYMPTOMS
DISTRIBUTION OF CASES ACCORDING TO CARDINAL SYMPTOMS
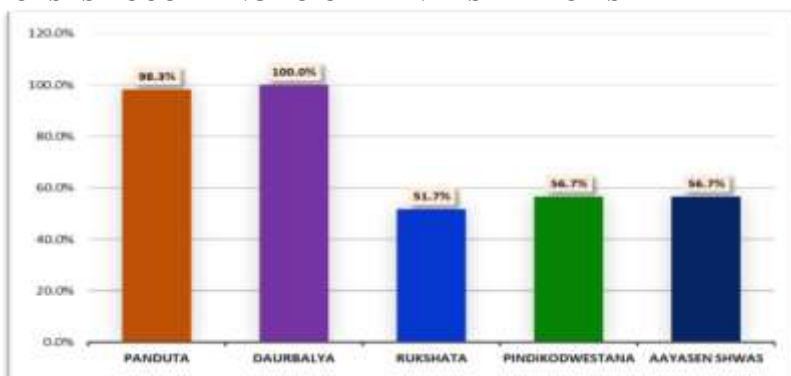
Panduta was present in 98.3% of individuals, while *Daurbalya* was observed in all (100%). *Rukshata* affected 51.7%, *Pindikodwestana* 56.7%, and *Aayasen Shwas* was noted in 56.7%.

DISTRIBUTION OF CASES ACCORDING TO ASSOCIATED SYMPTOMS
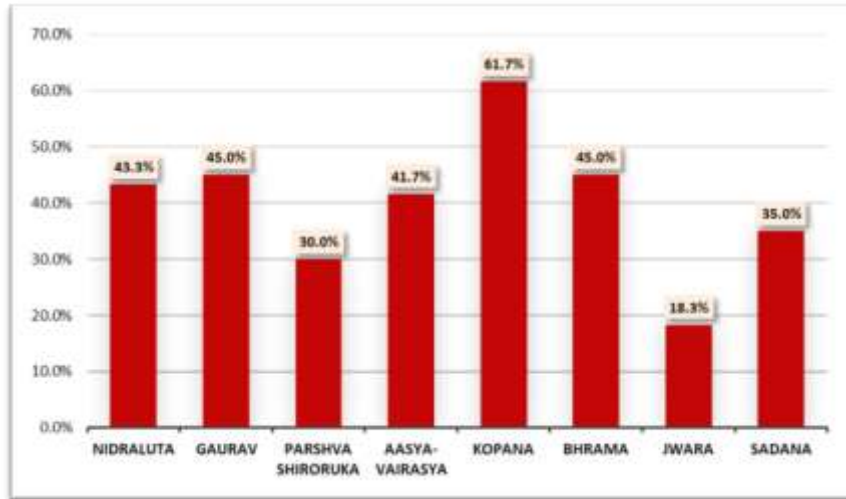
Nidraluta was present in 43.3% of individuals, *Gaurava* in 45%, and *Parshva Shiroruka* in 30%. *Aasya-Vairasya* affected 41.7%, *Kopana* 61.7%, *Bhrama* 45%, *Jwara* 18.3%, and Sadana 35%.

DISTRIBUTION OF CASES ACCORDING TO *AGNI BALA*
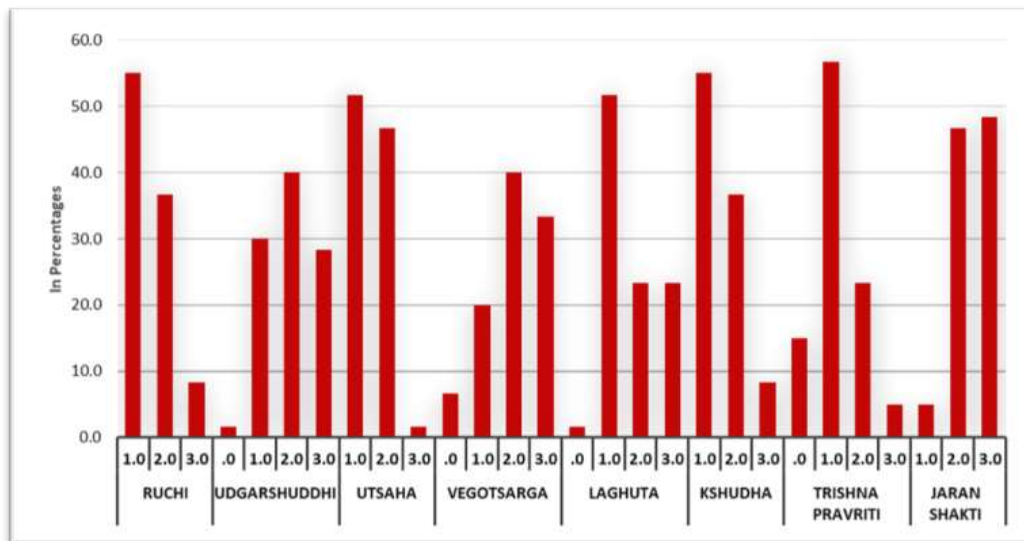
The assessment of *Agni Bala* parameters shows varied grades among the population. For **Ruchi,** 55.0% were graded at 1.0, 36.7% at 2.0, and 8.3% at 3.0.

For **Udgarshuddhi,** 1.7% were graded at 0.0, 30.0% at 1.0, 40.0% at 2.0, and 28.3% at 3.0.

Utsaha demonstrated that 51.7% of individuals were graded at 1.0, 46.7% at 2.0, and only 1.7% at 3.0.

For **Vegotsarga,** 6.7% were graded at 0.0, 20.0% at 1.0, 40.0% at 2.0, and 33.3% at 3.0. For *Laghuta*, 1.7% were graded at 0.0, 51.7% at 1.0, 23.3% at 2.0, and 23.3% at 3.0.

Regarding **Kshudha,** 55.0% were graded at 1.0, 36.7% at 2.0, and 8.3% at 3.0.

For **Trishna Pravriti,** 15.0% were graded at 0.0, 56.7% at 1.0, 23.3% at 2.0, and 5.0% at 3.0.

Lastly, for **Jaran Shakti,** 5.0% were graded at 1.0, 46.7% at 2.0, and 48.3% at 3.0.

DISTRIBUTION OF CASES ACCORDING TO OBJECTIVE CRITERIA
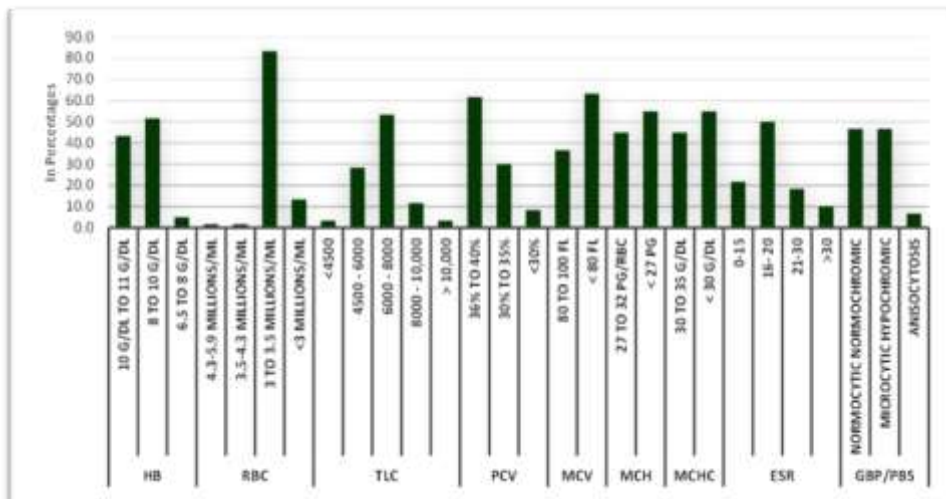
The distribution of haemoglobin (Hb) levels showed that 43.3% of individuals had 10-11 g/dl, 51.7% had 8-10 g/dl, and 5% had 6.5-8 g/dl. For red blood cell (RBC) counts, 83.3% had 3-3.5 million/µl, 13.3% had <3 million/µl, and 1.7% had higher counts. Total leukocyte count (TLC) showed 53.3% between 6000-8000/µl, 28.3% between 4500-6000/µl, with smaller percentages outside these ranges.

For packed cell volume (PCV), 61.7% were in the 36-40% range, 30% had 30-35%, and 8.3% had <30%. Mean corpuscular volume (MCV) was <80 fL in 63.3%, while 36.7% had 80-100 fL. Mean corpuscular haemoglobin (MCH) was <27 pg/RBC in 55%, and 45% had 27-32 pg/RBC. Mean corpuscular haemoglobin concentration (MCHC) was <30 g/dl in 55%, with 45% in the 30-35 g/dl range.

For erythrocyte sedimentation rate (ESR), 50% had 16-20 mm/hr, 21.7% had 0-15 mm/hr, 18.3% had 21-30 mm/hr, and 10% had >30 mm/hr. The general blood picture (GBP/PBS) revealed 46.7% normocytic normochromic RBCs, 46.7% microcytic hypochromic, and 6.7% anisocytosis.

RESULTS
COMPARISON OF SUBJECTIVE PARAMETERS BEFORE, DURING AND AFTER TREATMENT (CARDINAL SYMPTOMS)

SUBJECTIVE CRITERIA Cardinal symptoms	Before treatment		During treatment		After treatment		% change	Friedman test	
	Mean severity score	SD	Mean severity score	SD	Mean severity score	SD		chi sq	p-value
Panduta	1.60	0.83	1.60	0.83	0.78	0.74	51.04	92.0	**<0.001**
Daurbalya	1.43	0.56	1.43	0.56	0.57	0.62	60.47	104.0	**<0.001**
Rukshata	0.63	0.69	0.53	0.68	0.18	0.43	71.05	43.1	**<0.001**
Pindikod-veshtana	0.83	0.89	0.83	0.89	0.38	0.64	54.00	54.0	**<0.001**
Ayasen Shwasa	0.82	0.85	0.82	0.85	0.35	0.66	57.14	56.0	**<0.001**
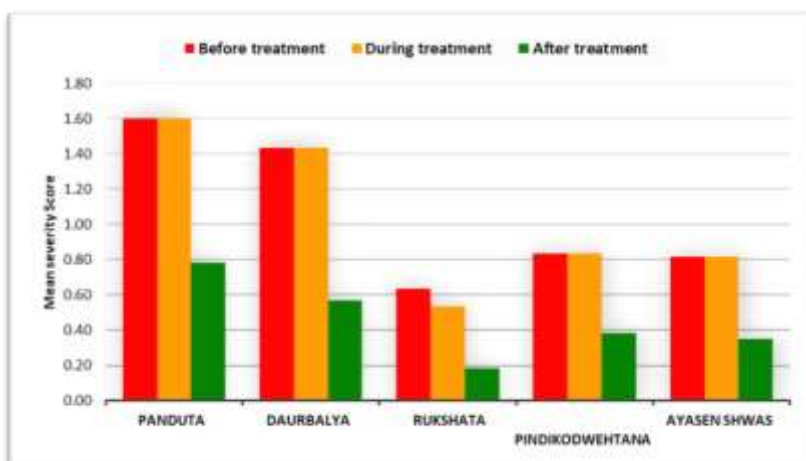
Significant improvements were observed in all cardinal symptoms after treatment. *Panduta* severity decreased by 51.04%, from a mean score of 1.60 to 0.78 (p<0.001). *Daurbalya* improved by 60.47%, with scores dropping from 1.43 to 0.57 (p<0.001). *Rukshata* reduced by

71.05%, from 0.63 to 0.18 (p<0.001). *Pindikodvestana* showed a 54.00% reduction, from 0.83 to 0.38 (p<0.001). *Ayasen Shwasa* decreased by 57.14%, from 0.82 to 0.35 (p<0.001). All results were statistically significant, confirming effective symptom management.

COMPARISON OF SUBJECTIVE PARAMETERS BEFORE, DURING AND AFTER TREATMENT (ASSOCIATED SYMPTOMS & *AGNI BALA*)

| SUBJECTIVE CRITERIA – Associated Symptoms & *Agni Bala*	Before treatment		During treatment		After treatment		% change	Friedman test	
	Mean severity score	SD	Mean severity score	SD	Mean severity score	SD		chi sq	p-value
Nidraluta	0.65	0.90	0.65	0.90	0.28	0.61	56.41	44.00	**<0.001**
Gaurava	0.70	0.93	0.57	0.81	0.18	0.47	73.81	46.50	**<0.001**
Parshva shiroruka	0.40	0.74	0.40	0.74	0.18	0.50	54.17	26.00	**<0.001**
Aasya-Vairasya	0.53	0.72	0.47	0.62	0.08	0.28	84.38	44.70	**<0.001**
Kopana	0.88	0.87	0.88	0.87	0.35	0.63	60.38	62.00	**<0.001**
Bhrama	0.50	0.60	0.48	0.60	0.17	0.42	66.67	38.10	**<0.001**
Jwara	0.23	0.62	0.20	0.51	0.08	0.33	64.29	14.00	**0.001**
Sadana	0.58	0.94	0.72	1.63	0.25	0.63	57.14	30.90	**<0.001**
Ruchi	1.53	0.65	1.38	0.64	0.38	0.64	75.00	115.10	**<0.001**
Udgarshuddhi	1.95	0.81	1.67	0.80	0.68	0.79	64.96	107.60	**<0.001**
Utsaha	1.50	0.54	1.37	0.52	0.42	0.62	72.22	109.60	**<0.001**
Vegotsarga	2.00	0.90	1.47	0.85	0.33	0.75	83.33	104.30	**<0.001**
Laghuta	1.68	0.85	1.47	0.72	0.52	0.83	69.31	103.90	**<0.001**
Kshudha	1.53	0.65	1.20	0.44	0.22	0.45	85.87	110.90	**<0.001**
Trishna Pravriti	1.18	0.75	1.07	0.61	0.33	0.54	71.83	80.30	**<0.001**
Jaran Shakti	2.43	0.59	2.22	0.61	1.47	0.50	39.73	93.90	**<0.001**
Abhyavaharana shakti	2.80	0.97	2.52	1.07	1.42	1.03	49.40	108.70	**<0.001**
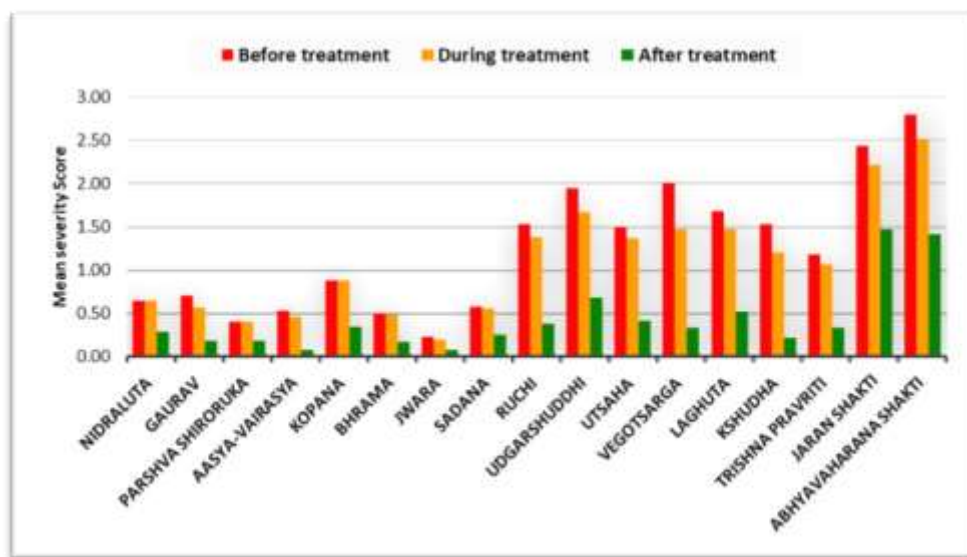
Significant improvements were observed in all associated symptoms and *Agni Bala* after treatment. *Nidraluta* showed a 56.41% reduction (p<0.001), *Gaurava* improved by 73.81% (p<0.001), and *Parshva Shiroruka* by 54.17% (p<0.001). *Aasya-Vairasya* had an 84.38% improvement (p<0.001), and *Kopana* reduced by 60.38% (p<0.001). *Bhrama* showed a 66.67% improvement (p<0.001), *Jwara* 64.29% (p=0.001), and *Sadana* 57.14% (p<0.001).

Ruchi improved by 75.00% (p<0.001), *Udgarshuddhi* by 64.96% (p<0.001), and *Utsaha* by 72.22% (p<0.001). *Vegotsarga* saw an 83.33% reduction (p<0.001), *Laghuta* 69.31% (p<0.001), and *Kshudha* 85.87% (p<0.001). *Trishna Pravriti* improved by 71.83% (p<0.001), *Jaran Shakti* by 39.73% (p<0.001), and *Abhyavaharana Shakti* by 49.40% (p<0.001).

All results were statistically significant, indicating effective symptom management and significant enhancement in *Agni Bala* during the trial period.

COMPARISON OF OBJECTIVE PARAMETERS BEFORE AND AFTER TREATMENT

Objective Parameter	Before treatment		After treatment		% change	Wilcoxon test	
	Mean severity score	SD	Mean severity score	SD		z-value	p-value
Hb	1.62	0.58	1.28	0.56	20.62	-4.47	**<0.001**
RBC	2.08	0.46	1.93	0.36	7.20	-3.00	**0.003**
TLC	1.83	0.81	1.75	0.57	4.55	-1.67	0.096
PCV	1.47	0.65	1.12	0.49	23.86	-4.58	**<0.001**
MCV	0.63	0.49	0.27	0.45	57.89	-4.69	**<0.001**
MCH	0.55	0.50	0.23	0.43	57.58	-4.36	**<0.001**
MCHC	0.55	0.50	0.35	0.48	36.36	-3.46	**0.001**
ESR	1.17	0.89	0.88	0.64	24.29	-4.12	**<0.001**
GBP/PBS	0.67	0.80	0.40	0.74	40.00	-3.64	**<0.001**
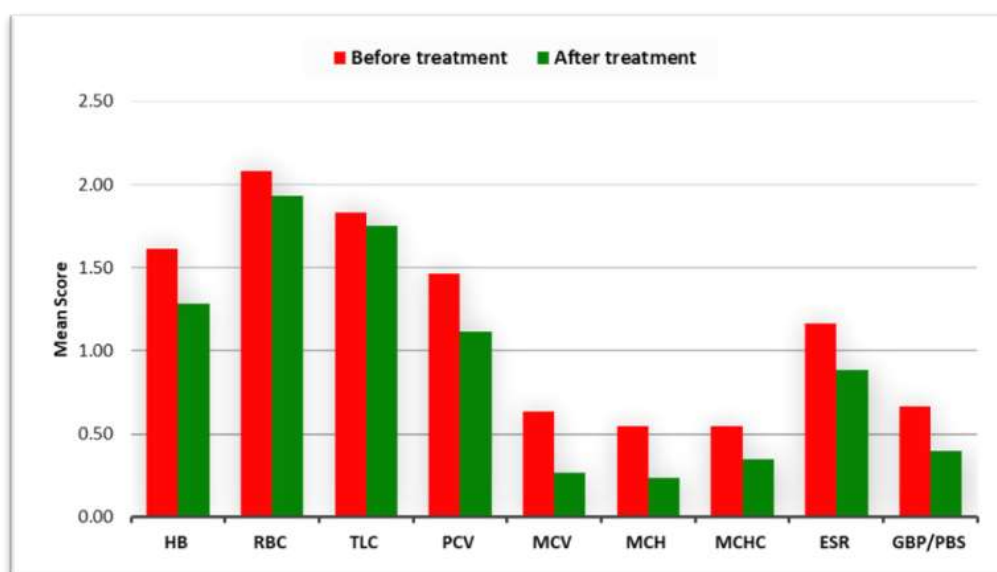
The comparison of objective parameters before and after treatment showed significant improvements, as indicated by reductions in mean severity scores:

Haemoglobin levels: The mean severity score decreased by 20.62% (p<0.001), indicating improvement.

RBC count: A reduction of 7.20% in the mean severity score (p=0.003) reflects improvement.

TLC: Although the mean severity score decreased by 4.55%, this change was not statistically significant (p=0.096).

PCV: The mean severity score dropped by 23.86% (p<0.001), showing significant improvement.

MCV: The mean severity score decreased by 57.89% (p<0.001), indicating a marked improvement.

MCH: A 57.58% reduction in mean severity score (p<0.001) reflects improvement.

MCHC: The mean severity score decreased by 36.36% (p=0.001), showing improvement.

ESR: The mean severity score decreased by 24.29% (p<0.001), indicating improvement.

GBP/PBS: The mean severity score decreased by 40.00% (p<0.001), reflecting improvement.

These findings confirm a significant decrease in mean severity scores, indicating improvements in most objective parameters post-treatment.

OVERALL STATUS OF FINAL IMPROVEMENT

Legend:
- Marked improvement
- Moderate improvement
- Mild improvement
- No improvement
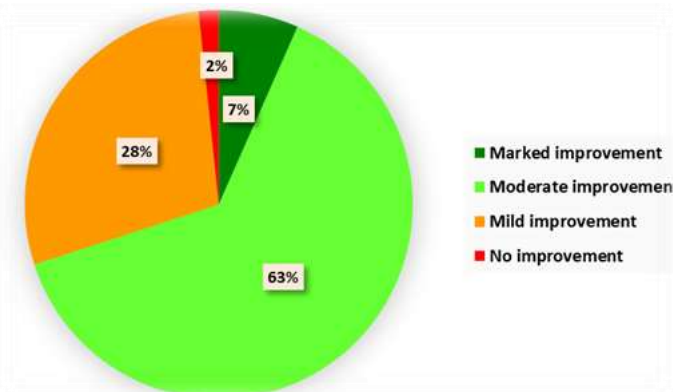
Post-treatment outcomes revealed that 6.7% of patients experienced marked improvement, 63.3% had moderate improvement, 28.3% showed mild improvement, and 1.7% reported no improvement.

DISCUSSION
Here's a more concise and organized version of your findings, focusing on clarity and coherence while preserving the essential details:

Age Distribution
The majority of subjects (46.7%) were aged 16 to 30, followed by those aged 31 to 40 (36.7%). Fewer participants were in the 41-50 years (10.0%), 51-60 years (5.0%), and 61-70 years (1.7%) age groups, indicating a predominant representation of younger adults. This demographic, often facing increased stress from professional responsibilities and dietary irregularities, is more susceptible to anaemia. Ayurvedic principles suggest that *Asatmya Ahara-Vihara* contributes significantly to the development of *Pandu Roga* in these younger individuals, particularly among women during menstruation and childbearing.

Gender Distribution
Females comprised 85.0% of the participants, while males made up 15.0%. The higher prevalence of *Pandu Roga* among women can be attributed to dietary habits, regular blood loss during menstruation, and insufficient iron intake to compensate for these losses. Additional factors include childbirth, abortions, and cultural practices like post-lunch napping (*Diwaswapna*), which may increase their risk of anaemia.

Religion Distribution
Hindus represented 81.7% of the study population, while Muslims accounted for 18.3%. The correlation between religion and anaemia prevalence may be influenced by dietary practices, as vegetarians (common among Hindus) are more susceptible to iron deficiency due to lower non-haem iron intake. Economic constraints and reliance on carbohydrate-rich diets among lower-income groups may also exacerbate this condition.

Marital Status
80.0% of patients were married, while 20.0% were unmarried. Marital stress and physiological factors related to frequent pregnancies and cultural dietary restrictions may contribute to the higher incidence of anaemia among married individuals.

Occupation
Housewives comprised the largest group (58.3%), followed by students (18.3%), service-related jobs (10.0%), and business (10.0%). The stress from domestic responsibilities may impair digestion and contribute to nutritional deficiencies, including anaemia.

Education
33.3% of participants had higher secondary education, and 26.7% were graduates. Limited education may lead to a lack of awareness about nutritional needs, increasing the risk of developing anaemia.

Socio-Economic Status
The majority (58.3%) belonged to the lower middle class, followed by 35.0% in the middle class. Inadequate prenatal care, neglect of personal well-being, and reliance on fast foods contribute to the prevalence of anaemia.

Dietary Habits
55.0% of participants were vegetarian. Common dietary choices, such as oily and spicy foods, disrupt *Agni* functioning, leading to *Agnimandya* and increasing the risk of developing *Pandu Roga*.

Addiction
35.0% consumed tea, 6.7% coffee, and 11.7% used tobacco. Tannins in tea can hinder iron absorption, contributing to iron deficiency anaemia, while tobacco may aggravate *Pitta dosha* and further the progression of *Pandu Roga*.

Habitat
63.3% of participants resided in urban areas, where eating out and consuming unhealthy foods are common practices that may increase the risk of *Pandu*.

Rasa Pradhanata
The preferred tastes among participants included 28.3% *Katu* (pungent) and 8.3% *Lavana* (salty). Excessive consumption of certain tastes, especially from junk foods, can damage intestinal mucosa and contribute to nutritional deficiencies.

Agni Assessment
75.0% of patients had *Mandagni*, which can lead to Ama production and the subsequent development of various diseases.

Koshtha
11.7% were classified as *Mridu Kostha*, 58.3% as *Madhyama Kostha*, and 30.0% as *Krura Kostha*, indicating diverse digestive capabilities.

Bowel, Urine, and Sleep Habits
41.7% experienced irregular bowel movements, while 86.7% reported normal urine function. 60.0% had sound sleep, indicating a potential link between sleep disturbances and *dosha* imbalances, which may contribute to *Pandu Roga*.

Menstrual History
Among 56 female patients, 75.0% reported regular menses, while 21.4% had irregular cycles. The majority experienced moderate flow, with a small percentage reporting painful menses.

Built and Nutrition
60.0% were moderately built, while 21.7% rated their nutrition as poor. Poor digestion (*Agnimandya*) can hinder nutrient absorption, leading to anaemia despite consuming nutritious foods.

Treatment History
78.3% had not received any treatment for their condition, while 21.7% had undergone treatment previously. The absence of a family history of anaemia was noted in participants.

ETIOLOGICAL FACTORS
Aharaj Nidana
Excessive intake of *Kshar* and *Amala* was reported in 80.0% of individuals, with other dietary imbalances noted. These factors can lead to vitiation of Pitta and subsequent disruption of Agni.

Viharaj Nidana
The majority engaged in behaviours like excessive exercise (25.0%), which can aggravate *Vata* and *Pitta dosha*, leading to nutritional deficiencies.

Mansik Nidana
78.3% of patients reported stress-related factors like *Chinta*, which may contribute to *dosha* imbalances and increase vulnerability to *Pandu*.

DOSHA, DUSHYA & SROTODUSTI PAREEKSHA
Pradhana Dosha
Vata dosha was predominant in 55.0% of patients, indicating a tendency towards *Vataja Pandu*.

Pradhana Dushya
88.0% of patients exhibited *Rasa* as the primary *Dushya*, with symptoms suggesting deficiencies in both *Rasa* and *Rakta*.

Srotodushti
Rasavaha was found in 100% of patients, with symptoms like *Aasya vairasya* and *Pandutva* prevalent.

DASVIDHA PAREEKSHA
Prakriti
48.3% had *Vata-Pitta Prakriti*, which is associated with a higher risk of Pitta-related conditions like *Pandu*.

Sara & Samhanan
Most patients had *Madhyama Sara* (65.0%) and *Samhanan* (60.0%), indicating an increased susceptibility to diseases.

Pramana
66.7% were classified as having *Madhyam Praman*, which may contribute to disease progression.

Satva & Satmya
61.7% exhibited Madhyam Satva, potentially impacting their overall health and disease susceptibility.
Vaya: A significant majority (98.3%) of participants were in the *Madhyama Vaya* category. This aligns with the understanding that middle-aged individuals, who typically exhibit a natural dominance of *Pitta dosha*, are more susceptible to *Pitta*-dominant diseases.

Vyayam Shakti: The study revealed that 55.0% of patients reported *Avara Vyayam Shakti*, while 36.7% exhibited *Madhyam Vyayam Shakti*, and only 8.3% showed *Pravara Vyayam Shakti*. This decrease in physical capacity can be attributed to the *Daurbalyta* associated with *Pandu Roga*.

Aahar Shakti
Regarding *Aahar Shakti*, 60.0% of patients were found to have *Madhyama Abhyavarana Shakti*, followed by 35.0% with *Avara Abhyavarana Shakti* and only 5.0% with *Pravara Abhyavarana Shakti*. Similarly, 48.3% of patients had *Avara Jarana Shakti*, 46.7% had *Madhyama Jarana Shakti*, and just 5.0% had *Pravara Jarana Shakti*. Given that *Pandu* is a psychosomatic disease, it significantly affects *Agni*, leading to decreased *Abhyavarana* and *Jarana Shakti* in patients.

DISCUSSION ON THE TRIAL DRUG DARVYADI LAUHA
Darvyadi Lauha is a herbo-mineral formulation selected from the *Chakradutta Pandu Roga Chikitsa Prakaran* (8/29). It comprises *Daruharidra, Haritaki, Vibhitaki,*

Amalaki, Shunthi, Maricha, Pippali, Vidanga, and *Lauha Bhasma,* combined with *Madhu* and *Ghrita* as *Anupana* in varying proportions.

Probable Mode of Action
The *Katu Rasa* predominant in *Darvyadi Lauha* promotes *Agni Deepana*, *Pachana*, and *Shodhana*, facilitating the clearance of obstructed *Srotasa* and aiding in the disruption of pathogenesis in *Pandu Roga*.

Key Ingredients and Their Actions
Daruharidra: Acts as a liver stimulant, enhancing *Mandagni* and addressing *Alparaktata* while exhibiting anti-anemic properties.

Haritaki: Known for its strengthening and digestive properties, effective in treating *Pandu*.

Vibhitaki: Supports the health of *Rasa, Rakta, Mamsa*, and *Meda Dhatu*.

Amalaki: Offers *Tridoshahara* effects and enhances circulation of *Rasa* and *Rakta Dhatu*.

Shunthi & Maricha: Promote digestion and help eliminate *Ama* by kindling *Jatharagni*, *Rasagni*, and *Bhutagni*.

Pippali: Enhances bioavailability, absorption, and nutrient assimilation while supporting the treatment of *Panduroga*.

Vidanga: Aids digestion and prevents intestinal infestations.

Lauha Bhasma: A potent *Rasayana* that addresses iron deficiency and enhances *Jatharagni* and *Dhatwagni*.

Ghrita: Exhibits *Pittahara* and nourishment properties, supporting digestion.

Madhu: Offers digestive benefits and clears metabolic pathways.

The synergistic effects of these ingredients strengthen *Jatharagni* and *Dhatwagni*, improving the quality and quantity of Rasa and Rakta Dhatu. Additionally, the formulation's *Srotovishodhana* property alleviates *Srotosanga*, ensuring effective nourishment of the body.

DISCUSSION ON RESULTS
Discussion on the Effect of *Darvyadi Lauha* in Subjective Parameters
CARDINAL SYMPTOMS
Panduta
Panduta was present in 98.3% of patients. For the effect of therapy, it is observed that 51.04% relief with *Darvyadi Lauha* was found statistically highly significant with a Friedman test chi-square value of 92.0 and a p-value of <0.001.

In *Pandu,* both the quantity and quality of the *Poshya Bhaga* of *Rasa Dhatu* are diminished. When *Raktagni* acts on *Poshya Bhaga*, it transforms into *Rakta Dhatu. Varna and Prabha* are the properties of *Rakta and Ojas*.

रक्तं वर्णप्रसादं मांसपुष्टिं जीवयति च।　　　*Su.Su.*15/5

Whenever *Ojokshaya, Raktakshaya,* or *Pittakshaya* occurs *Panduta* appears.

पित्ते मन्दोऽनलः शीतं प्रभाहानिः।　　　*A.H.Su.* 11/16

Darvyadi Lauha possesses *Deepana* and *Yakrituttejaka* properties. The *Deepana* effect rectifies vitiated *Agni*, thereby enhancing the *Poshya Bhaga* of *Rakta*. Since the *Yakrit* is the *Moola* of the *Raktavaha Srotasa*, administering this medicine helps to restore the proper function of these channels. Additionally, it balances *Pitta*, as the *Yakrit* is its site, thus effectively overcoming *Panduta*.

Daurbalya
This symptom was present in 100% of patients. Regarding the effect of therapy, results were highly significant with a 60.47% improvement, with a chi-square value of 104.0 and a p-value of <0.001.

In *Panduroga Chikitsa*, *Acharya Charaka* describes patients with *Pandu* as *Nihsara* and *Shithilendriya*. *Nihsara* refers to the depletion of all eight varieties of *Sara* (the essence of *Dhatus*), resulting in weakness across all *Indriyas*, including *Panchagyanendriya*, *Panchakarmendriya*, and *Mana*. This condition arises from *Dhatukshaya, Ojakshaya*, and *Raktalpta*, leading to debility, or *Daurbalya*. *Oja* is synonymous with *Bala*.

Darvyadi Lauha contains *Triphala*, which has *Rasayana properties*, while *Trikatu* improves *Mandagni*, thereby addressing *Ama* and facilitating the production of new *Dhatu*. *Haritaki* enhances intellect, sensory perception, and vitality.

हरीतकी .... बुद्धीन्द्रियबलप्रदाम्॥　　*Ch.Chi.*1/1/30

Rukshata
It was found in 51.7% of patients. It is due to the vitiation of *Ruksha Guna* of *Vata Dosha*. The percentage of relief was 71.05% which is highly significant. supported by a chi-square value of 43.1 and a p-value of <0.001.

Approximately 66% of the components in *Darvyadi Lauha* possess *Ushna Veerya* and *Madhur Vipaka*, which may aid in alleviating symptoms by balancing *Vata Dosha*. Another factor contributing to this improvement is the administration of the medicine with *Ghrita* and *Madhu* as *Anupana* (in an unequal ratio), with a higher quantity of *Ghrita* and a smaller amount of *Madhu*. This

combination helps reduce *Rukshata* and minimizes cell fragility.

Pindikodweshtana

Pindikodweshtana refers to cramps in the calf muscles. This condition may result from insufficient oxygen supply to the muscles, disrupting their metabolism and causing lactic acid accumulation. Additionally, it can be attributed to the *Karmatha* vitiation of *Vata Dosha*.

It was seen in 56.7% of patients, and the percentage of relief was 54.00% which is highly significant with a chi-square value of 54.0 and a p-value of <0.001.

Darvyadi Lauha includes drugs that possess *Vata Shamaka* properties, aiding in the relief of *Pindikodweshtana*. It also has *Deepana* and *Pachana* properties, which facilitate *Ama Pachana*. In this context, lactic acid can be viewed as a form of *Ama*.

Aayasen Shwasa

Dyspnoea on exertion or *Shwasa* in *Pandu* results from inadequate nourishment and *Raktalpata.* This condition forces the respiratory organs to function rapidly to ensure sufficient blood flow to the body's tissues, leading to the manifestation of *Shwasa.*

Aayasen Shwasa was found in 56.7% of patients and the percentage of relief found was 57.14%, which is highly significant, evidenced by a chi-square value of 56.0 and a p-value of <0.001.

Darvyadi Lauha contains *Trikatu*, which possesses *Swashahara* and *VataKaphahara* properties. Additionally, the inclusion of *Lauha Bhasma* helps to elevate Hb levels, potentially enhancing the oxygen-carrying capacity of RBCs, thereby reducing the need for the heart to pump as rapidly.

ASSOCIATED SYMPTOMS

Nidraluta

Nidraluta was seen in 43.3% of patients and 56.41% improvement was found by *Darvyadi Lauha* in *Nidraluta* with a chi-square value of 44.00 and a p-value of <0.001.

This symptom arises from insufficient blood and oxygen supply to the body's tissues and the brain. In Ayurveda, *Nidraluta* is recognized as a symptom of *Dhatu Shaithilya*. Many of the ingredients in *Darvyadi Lauha* possess *Deepana* properties, which help to correct *Agni*, subsequently enhancing the *Dhatu Poshana Krama*.

Gaurava

Gaurava was seen in 45.0% of patients. 73.81% improvement was found by *Darvyadi*

Lauha with a chi-square value of 46.50 and a p-value of <0.001.

Gaurava results from the diminished potency of tissues to carry out their normal functions. In patients with *Pandu*, it is noted that most exhibit *Mandagni*. This *Agnimandya* leads to the formation of *Aam*, which circulates throughout the body and manifests as *Gaurava*, a *Lakshana* of *Aam*. Additionally, an increase in the *Guru Guna* of *Kapha* contributes to this sensation of heaviness.

स्रोतोरोधबलभ्रंशगौरवानिलमूढता................ लिङ्गं मलानां सामान्यं.......।। *A.H.Su.* 13/23

Parshva Shiro Ruka

This symptom was observed in 30.0% of patients and improved by 54.17%, evidenced by a chi-square value of 26.00 and a p-value of <0.001.

Parshvashiroruka occurs due to the vitiation of *Vata* in the body. This vitiation arises from *Dhatukshaya*, specifically of *Rakta*. The *Rakta Vriddhikara* property of *Lauha* enhances both the quantity and quality of *Rakta*.

Aasyavairasya

This symptom is noted in *Rasavaha Sroto Dushti* and *Vataja Pandu.* It was observed in 41.7% of patients and after administration of the drug, the improvement noted was 84.38%, which is statistically highly significant (chi-square value: 44.70, p-value: <0.001.).

Darvyadi Lauha includes drugs with *Deepana* and *Pachana* properties. According to the *Chikitsa Sutra* for *Rasaja Vikara*, *Langhan* is a primary treatment. Both *Deepana* and *Pachana* are forms of *Langhan* that help improve *Rasa Dhatu Dushti*.

Kopana

This symptom was observed in 61.7% of patients and was improved by 60.38% (chi-square value:62.00, p-value:<0.001).

Kopana refers to anger arising from unreasonable causes, often stemming from misunderstandings and misconceptions. It occurs due to *Pitta Prakopa*, leading to irritability in anaemic patients. *Haritaki* is effective in alleviating the stupefaction of memory and intellect.

स्मृतिबुद्धिप्रमोहं च जयेच्छीघ्रं हरीतकी।। *Ch.Chi.* 1/1(34)

Bhrama

This symptom was observed in 45.0% of patients and was improved by 66.67% (chi-square value:38.10, p-value: <0.001).

The vitiation of *Raja, Pitta* and *Anila* is a cause of *Bhrama and Raja* initiates the process of *Bhrama.*

रज:पित्तानिलाद्भ्रमः। *Su.Sha.* 4/55

Amalaki and *Haritaki* possess *Rasayana* properties, which aid in reducing the *Raja Guna* in the body.

Jwara
This symptom was observed in 18.3% of the patients and 64.29% improvement, which is statistically significant (z-value: -2.71, p-value: 0.007*).*

Jwara is a symptom of *Rasavaha Srotodushti,* with *Mandagni* being its primary cause. The drugs in *Darvyadi Lauha* possess *Deepana* and *Aampachak* properties that help to rectify the pathogenesis.

Sadana
This symptom was observed in 35.0% of patients and was improved by 57.14%, which is statistically significant (chi-square value:14.00, p-value: 0.001).

Sadana arises from *Ojovisrans* and *Karma Vriddhi* of *Vata*. *Darvyadi Lauha* exhibits *Vatashamak* and *Dhatuposhak* properties, which help to improve the *Sadana.*

AGNI BALA
In the assessment of *Agni Bala* after the administration of *Darvyadi Lauha*, significant improvements were observed across all parameters, reflecting its potent role in correcting the impaired digestive and metabolic functions associated with *Pandu Roga*. The combined *Deepana* (digestive stimulant), *Pachana* (digestive), *Srotovishodhana* (channel-cleansing), and *Rasayana* (rejuvenating) properties of the ingredients work synergistically to strengthen both *Jatharagni* (digestive fire) and *Dhatwagni* (metabolic fire), resulting in the effective management of anaemia.

Ruchi (Appetite)
Ruchi showed a 75.00% improvement, with a highly significant chi-square value of 115.10 and a p-value of <0.001. The improvement in appetite is attributed to the *Deepana* and *Pachana* properties of herbs like *Shunthi*, *Pippali*, and *Maricha*, which enhance *Jatharagni*, promoting better digestion and appetite restoration.

Jaran Shakti (Digestive Power)
Udgarshuddhi (Belching Quality): Improved by 64.96%, with a chi-square value of 107.60 and a p-value of <0.001. This reflects enhanced digestion, with non-sour belching indicating that the digestive fire has been restored. The *Pachana* effects of *Haritaki*, *Vibhitaki*, and *Vidanga* clear digestive toxins and improve metabolism.

Utsaha (Energy and Enthusiasm): Improved by 72.22%, with a chi-square value of 109.60 and a p-value of <0.001. Enhanced vitality is due to the *Rasayana* properties of *Amalaki* and *Haritaki*, which nourish and strengthen *Dhatu*, improving overall energy and stamina.

Vegotsarga (Proper Evacuation of Bowels): Improved by 83.33%, with a chi-square value of 104.30 and a p-value of <0.001. This indicates better bowel function, aided by the *Srotovishodhana* properties of *Triphala* (*Haritaki*, *Vibhitaki*, *Amalaki*), which regulate digestion

and ensure proper excretion, reducing constipation and digestive stagnation.

Laghuta (Lightness of the Body): Improved by 69.31%, with a chi-square value of 103.90 and a p-value of <0.001. The feeling of lightness is a result of the removal of digestive toxins (*Ama*) and the enhanced metabolism promoted by *Shunthi*, *Pippali*, and *Maricha*.

Kshudha (Hunger): *Kshudha* improved by 85.87%, with a chi-square value of 110.90 and a p-value of <0.001. Hunger represents the body's need for food to fuel metabolism, and in *Pandu Roga* patients, *Mandagni* (weak digestive fire) diminishes this vital sensation. The improvement is primarily due to the *Deepana* effects of *Shunthi*, *Pippali*, and *Maricha*, which reignite *Jatharagni*, thereby restoring the natural urge for food intake. This signals a healthy metabolic reset, crucial for improving nutritional status and combating anaemia.

Trishna Pravritti (Thirst): *Trishna Pravritti* showed a 71.83% improvement, with a chi-square value of 80.30 and a p-value of <0.001. Thirst, or the body's ability to regulate fluid intake, is often disrupted in *Pandu Roga* due to imbalances in *Pitta* and the presence of *Ama* (digestive toxins). The improvement in thirst regulation is attributed to the *Srotovishodhana* (channel-cleansing) and *Pachana* (digestive) properties of ingredients like *Triphala* and *Daruharidra*. These herbs help eliminate *Ama*, clearing blocked channels and normalizing fluid metabolism. By improving *Ama Pachana*, the body restores its natural thirst mechanism, leading to proper hydration and electrolyte balance.

Abhyavaharana Shakti (Capacity to Eat and Digest Food)
In the study, *Abhyavaharana Shakti* demonstrated a 49.40% improvement, with a significant chi-square value of 108.70 and a p-value of <0.001. This enhancement indicates a marked increase in the body's ability to consume and digest food efficiently, alleviating discomfort and indigestion. The trial drug, *Darvyadi Lauha*, contributes to this improvement through key ingredients like *Shunthi, Pippali,* and *Vidanga*, which enhance *Jatharagni*. The *Deepana* and *Pachana* properties of these herbs stimulate appetite and promote digestion from the outset. *Shunthi* and *Pippali* invigorate *Agni* (digestive fire), preventing *Ama* formation and ensuring proper food breakdown. Additionally, *Vidanga* enhances digestive strength by addressing factors like intestinal parasites that may hinder digestion. Collectively, these ingredients restore effective digestion, improve *Abhyavaharana Shakti*, and alleviate symptoms of weak digestion associated with *Pandu Roga*.

Discussion on the Effect of Darvyadi Lauha in Objective Parameters
Effect on Haemoglobin (Hb)
Baseline data indicated that most participants had Hb levels between 8g/dl and 11g/dl, with some below 8g/dl.

After treatment with *Darvyadi Lauha*, Hb levels improved significantly, with a mean percentage change of 20.62% (z-value -4.47, p < 0.001). This improvement highlights *Darvyadi Lauha's* efficacy in addressing anaemia by enhancing *Agni* and nutrient assimilation for Hb synthesis.

Effect on Total RBC Count
Initially, 83.3% of participants had RBC counts between 3 and 3.5 million/μl. Post-trial, the RBC count increased by 7.20% (z-value -3.00, p = 0.003), indicating that *Darvyadi Lauha* improved both RBC production and quality by correcting *Agni* and nutrient absorption.

Effect on Total Leucocyte Count (TLC)
Pre-trial, 53.3% of participants had TLC values between 6000 and 8000/μl. There was a slight non-significant reduction in TLC by 4.55% post-trial (z-value -1.67, p = 0.096), suggesting that while RBC indices are the primary focus, *Darvyadi Lauha* does not adversely impact leucocyte counts.

Effect on Packed Cell Volume (PCV)
PCV improved significantly by 23.86% after administration of *Darvyadi Lauha* (mean change from 1.47 ± 0.65 to 1.12 ± 0.49, z-value -4.58, p < 0.001). This indicates an enhancement in red blood cell mass, attributed to improved *Agni* and *Dhatu Poshan*.

Effect on Mean Corpuscular Volume (MCV)
Before the trial, 63.3% of individuals had MCV values below 80 fL, indicating microcytosis. Post-trial, MCV improved significantly by 57.89% (p < 0.001), suggesting a shift towards normocytic red blood cells and improved iron metabolism facilitated by *Darvyadi Lauha*.

Effect on Mean Corpuscular Haemoglobin (MCH)
MCH improved by 57.58% post-trial (z-value -4.36, p < 0.001), indicating enhanced iron utilization and haemoglobin synthesis, contributing to better oxygen transport and alleviation of fatigue and lethargy.

Effect on Mean Corpuscular Haemoglobin Concentration (MCHC)
Initially, 55.0% of participants had MCHC values below 30 g/dl. Post-trial, MCHC improved by 36.36% (z-value -3.46, p = 0.001), reflecting enhanced haemoglobin concentration in red blood cells, improving oxygen-carrying capacity.

Effect on Erythrocyte Sedimentation Rate (ESR):
Before the trial, 50.0% of participants had ESR levels between 16 and 20 mm/hr. After treatment, ESR levels decreased by 24.29% (z-value -4.12, p < 0.001), indicating that *Darvyadi Lauha* not only addressed anaemia but also reduced underlying inflammation or chronic stress.

Effect on General Blood Picture/Peripheral Blood Smear (GBP/PBS)
Before the trial, 46.7% of participants exhibited normocytic normochromic red blood cells, while another 46.7% showed microcytic hypochromic cells. Post-trial analysis indicated a significant shift towards normochromic and normocytic cells, with a 40.00% improvement (z-value -3.64, p < 0.001), reflecting enhanced blood health and iron status, aligned with the therapeutic effects of *Darvyadi Lauha* and correction of *Agni*.

DISCUSSION ON THE ROLE OF AGNI IN THE ETIOPATHOGENESIS OF PANDU ROGA
In this study, patient assessments revealed that 15.0% rated their nutritional status as good, 63.3% as moderate, and 21.7% as poor, indicating that many patients suffered from nutritional deficiencies despite adequate dietary intake. Pre-trial evaluations showed that 75.0% of patients exhibited *Mandagni*, which hindered their ability to consume sufficient food and impaired nutrient absorption, leading to nutritional deficiency diseases like anaemia. Proper digestion and assimilation are crucial for obtaining the full benefits of nutrition; however, *Agnimandya* disrupts these processes, resulting in conditions such as *Pandu*.

Post-trial assessments demonstrated a significant improvement in Agni Bala parameters and other subjective and objective measures, attributed to the trial drug, Darvyadi Lauha. This formulation's *Agni Deepana*, *Pachana*, and *Shodhana* properties synergistically enhanced both *Jatharagni* and *Dhatwagni*, thereby improving *Dhatu* formation and *Poshan.*

These findings underscore the importance of normalising *Agni* for effective *Dhatu Poshan* and formation. Without this normalisation, even a nutritious diet may be inadequate in preventing conditions like *Pandu Roga*.

CONCLUSION
Based on a thorough review of the literature and detailed analysis, the following conclusions are drawn from the present study:
Pandu and Anaemia: *Pandu* is not synonymous with anaemia; instead, anaemia is a condition under the broader category of Pandu, which includes various diseases like anaemia and jaundice. In Ayurveda, blood is considered a composite of *Rasa* and *Rakta Dhatu*.

Role of *Agni*: *Agni* is essential for maintaining biological systems. Disturbances in *Agni* due to causal factors (*Nidan Sevana*) lead to disease onset. *Rasagni* is crucial for forming *Rakta Dhatu* from *Rasa Dhatu*. Disturbances in *Rasagni*, especially from *Vata* and *Kapha dosha*, result in *Dhatwagnimandya*, leading to deficiencies in *Rakta Dhatu*.

Impact of *Agnimandya*: Many patients today experience *Agnimandya* due to faulty lifestyles, impairing nutrient

absorption even from well-balanced diets. The study found that 63.3% of participants consumed moderately nourishing food but still suffered from *Pandu* due to *Mandagni* in 75.0% of cases.

Efficacy of *Darvyadi Lauha*: The ingredients in *Darvyadi Lauha*, characterized by *Katu rasa*, *Ushna Veerya*, and *Deepana, Pachana*, and *Rasayana* properties, effectively improve *Agni* and address the pathogenesis of *Pandu Roga*. The study observed that 6.7% of individuals experienced marked improvement, 63.3% showed moderate improvement, 28.3% had mild improvement, and only 1.7% reported no improvement.

Hence, the null hypothesis is rejected and the alternate hypothesis is accepted.

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