THE THERAPEUTIC POTENTIAL OF *PUNARNAVADI KWATH* IN THE MANAGEMENT OF KIDNEY DISEASES: A REVIEW FOR PATIENTS OF HAEMODIALYSIS

FINAL REPORT

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Abstract

Introduction: Chronic Kidney Disease (CKD) poses a significant global health burden, often necessitating interventions like haemodialysis. This study aimed to evaluate the therapeutic potential of *Punarnavadi Kwath*, an established Ayurvedic formulation, in the management of kidney diseases, particularly for patients who may be candidates for undergoing haemodialysis.

Methods: This was a prospective, open-label, two-group observational study conducted over a duration of 6 weeks. A sample size of 50 patients was recruited (Group A and Group B, 25 patients in each) from the Outpatient Department (OPD) and Inpatient Department (IPD) of Mahaveer College of Ayurvedic Science Hospital, Sundra, Rajnandgaon, Chhattisgarh, India. The primary purpose was to assess the efficacy of *Punarnavadi Kwath* in this specific patient population.

Results: The study observed notable overall percentage improvements in various evaluation criteria. Significant improvements were seen in subjective symptoms by comparing two groups. Group A consistently demonstrated notably higher percentage improvements across most evaluation criteria compared to Group B. Specifically, Group A showed remarkable gains in subjective symptoms such as Vomiting (100% improvement), Anorexia (90%), Edema (80%), and both Nocturia and Mutradaha (70% each). Significant improvements were also observed in objective parameters for Group A, including Dyspnea (61%), Pruritis (37%), Mutrakrucha (33%), Mutralpata (33%), Serum Creatinine (28%), Blood Urea (25%), and GFR (18%). While most parameters favored Group A, Anemia showed only a 4% improvement in Group A, compared to 11% in Group B. Statistically highly significant improvements were seen in Blood Urea, Serum Creatinine, GFR, Pruritis, Nocturia, *Mutravarodha*, *Mutrakrucha*, *Mutradaha* and *Mutralpata*. Significant improvements were seen in Dyspnea, Anorexia and Vomiting. Non-significant results were seen in Dozing or Sleepiness and Anaemia.

Discussion: This observational study provides preliminary insights into the real-world application and perceived efficacy of *Punarnavadi Kwath* in kidney disease management within an Ayurvedic clinical setting. The findings are expected to contribute to the understanding of this traditional formulation's therapeutic potential, particularly in the context of patients with advanced renal conditions requiring or undergoing haemodialysis. Further controlled clinical trials are warranted to validate these observations and establish definitive evidence of its efficacy.

Objectives Achieved in This Study:

This study successfully met its primary and secondary objectives, providing a comprehensive assessment of the therapeutic efficacy of *Punarnavadi Kwath* in managing Chronic Kidney Disease (CKD) symptoms and parameters.

Primary Objective:

The study effectively assessed the effect of *Punarnavadi Kwath* on key renal function parameters. Significant improvements were evidenced in Group A, with a 25% improvement in Blood Urea, 28% in Serum Creatinine, and 18% in GFR. Group B also showed improvements in these parameters, specifically 15% for Blood Urea, 6.2% for Serum Creatinine, and 11% for GFR.

Secondary Objectives:

The study successfully evaluated the impact of *Punarnavadi Kwath* on the frequency and severity of symptoms associated with kidney disease and its role in managing certain complications. Notable improvements were observed across a range of subjective symptoms and objective parameters:

- **Vomiting:** Group A achieved a remarkable 100% improvement, significantly higher than Group B's 8%.
- **Anorexia:** Group A showed a 90% improvement, compared to Group B's 50%.
- **Edema:** Group A demonstrated an 80% improvement, while Group B saw 25%.
- **Nocturia:** Group A experienced a 70% improvement, versus Group B's 26%.
- **Mutradaha:** Group A improved by 70%, substantially more than Group B's 15%.
- **Dyspnea:** Group A recorded a 61% improvement, in contrast to Group B's 15%.
- **Thirst:** Group A saw a 58% improvement, considerably higher than Group B's 12%.
- **Pruritis**: Group A improved by 37%, compared to Group B's 13%.
- **Dozing** or **Sleepiness**: Group A showed a 36% improvement, versus Group B's 16%.
- **Mutrakrucha**: Both groups showed good improvement, with Group A at 33% and Group B at 30%.
- **Mutralpata**: Group A improved by 33%, while Group B showed 11%.
- **Mutravarodha**: Group A recorded a 26% improvement, against Group B's 18%.
- **Anemia**: Group B showed a higher improvement of 11%, compared to Group A's 4%.

Overall, the study indicates that *Punarnavadi Kwath* significantly contributes to improving renal function markers and alleviating a broad spectrum of associated symptoms, with Group A generally experiencing more pronounced benefits.

THE THERAPEUTIC POTENTIAL OF *PUNARNAVADI KWATH* IN THE MANAGEMENT OF KIDNEY DISEASES: A REVIEW FOR PATIENTS OF HAEMODIALYSIS

INTRODUCTION

Chronic Kidney Disease (CKD) is a type of long-term kidney disease, defined by the sustained presence of abnormal kidney function and/or abnormal kidney structure. To meet criteria for CKD, the abnormalities must be present for at least three months. Early in the course of CKD, patients are usually asymptomatic, but later symptoms may include swelling of legs and face, feeling tired, vomiting, loss of appetite, and confusion. Complications can relate to hormonal dysfunction of the kidneys and include (in chronological order) high blood pressure (often related to activation of the renin–angiotensin system), bone disease, and anaemia. Additionally, CKD patients have markedly increased cardiovascular complications with increased risks of death. CKD can lead to end-stage kidney failure requiring dialysis or kidney transplantation.[1]

The definition of chronic kidney disease has been simplified over the last 10 years. It is now defined as the presence of kidney damage for a period greater than 3 months. An estimated or measured Glomerular filtration rate of less than 60 ml/min/1.73 m2 is considered abnormal for all adults.[2] Chronic Kidney Disease is reported to be a silent epidemic disease.[3] CKD is unique amongst the chronic non-infectious illness.[4]

Chronic Kidney Disease is identified by a blood test for Creatinine, which is a breakdown product of muscle metabolism. Higher levels of Creatinine indicate a lower Glomerular filtration rate and as a result a decreased capability of the kidneys to excrete waste products.[5]

Initially, it is manifested only as a biochemical abnormality. Eventually, loss of the excretory, metabolic and endocrine functions of the kidney leads to the development of the clinical signs and symptoms of renal failure, which are referred to as uraemia. When death is likely without Renal Replacement Therapy (RRT) in CKD stage 5, it is called End-Stage Renal Failure (ESRF).[6]

The prevalence of chronic kidney disease is high in developing countries. The prevalence of chronic kidney disease was high in north and southwest regions compared with other regions. The overall prevalence of CKD in the United States is expected to rise from 13% between 1999 to 2004 to 16.7% in 2030.The incidence and prevalence of non-communicable or so- called lifestyle diseases such as hypertension, diabetes, coronary artery disease, malignancies and other factors independently associated with kidney damage were age, sex, area of residence and hyperuricemia.[7,8]

80% of chronic disease deaths worldwide occur in developing countries where per capita income is low. Chronic Kidney Disease patients face a significant challenge due to the extremely limited treatment options available. Consequently, nutrition stands out as a crucial pillar in both the management and prevention of renal diseases. This is particularly critical given the alarming 7% global annual increase in the number of End-Stage Renal Failure (ESRF) patients.[9] It constitutes a major public health problem. Chronic Kidney Disease often coexists with cardiovascular disease and diabetes and is recognized as a risk factor for all-cause mortality.

In Ayurveda Chronic Kidney Disease cannot be correlated directly to any disease. According to the principles, CKD may be a disease of *Mootravaha Strotasa.* The signs and symptoms of CKD suggests aggravation mainly of *vata* and *Kapha doṣha* along with vitiation of multiple *duṣya* (i.e. initially *Rasa, Rakta, Mutra, Udaka* and later on all the *Dhatu* and *Upadhatu*). Multiple *Srotasa* (mainly *Rasavaha,*

Udakavaha, Mūtravaha and *Medavaha*) involved in Chronic Kidney Disease. Though all the three *Doṣa* as well as all the *Duṣya* are involved in the disease, *Kapha* is responsible in blocking micro-vessels and developing micro-angiopathy. *Vata* is responsible for degeneration of the structure of the kidney. According to Ayurvedic principles of management of the disease, tissue damage can be prevented and repaired by *Rasayana* drugs because they have the capability to improve qualities of tissues and hence increase resistance of the tissues. On the other hand, blockage can be removed by *Lekhana* drugs having scraping effect on blocked channels. Thus, *Rasayana* therapy along with the herbal preparations which has *Lekhana* properties and mitigates *Vata* and *Kapha* is useful in Chronic Kidney Disease.[10]

REVIEW OF LITERATURE

Ayurvedic Review

In *Ayurveda*, the term "*Basti*" is often associated with the urinary system, as it is frequently mentioned in the context of processes such as *Mutranirmana* (formation of urine), *Mutraghata* (obstruction of urine), *Mutrakrcchra* (difficult urination), *Mutrashmari* (urinary stones), and the pathogenesis of *Prameha* (diabetes).

Chronic kidney disease has no direct link to any of the Ayurvedic classics' clinical entities. All disorders cannot be labelled with a name, as stated in *Charaka Samhita, Sutrasthana Trisothiyadhyaya*. The physician should never be embarrassed if he or she does not understand the disease's name. In many cases, the same *Dosha* may circulate to other parts of the body, causing other diseases, so the treatment of the disease should be targeted once the location of the disease and its causes are determined. The diseases can be studied as provoked *Dosha*, specific causes, and their sites.[11] Good knowledge of *Vikara Prakarti*, *Adhishthanantarani* and *Samutthana Vishesha* is important for *Nidana* and *Chikitsa*.[12]

1. *Vikara Prakriti* (state of vitiated *Dosha*, *Dhatu*, and *Mala* which causing the disease)
2. *Adhishthanantarani* (site of vitiated *Dosha*)
3. *Samutthana Vishesha* (cause of vitiation of *Dosha*)

The main cause of all diseases is provoked *Dosha*. We can use the same methodology to study chronic kidney disease.[13]

Table 1: *Vikara Prakriti*, *Adhishthanantarani* and *Samutthana Vishesha* in Chronic kidney disease (CKD)

S. No	*Lakshana*	*Dosha*	*Dushya*	*Srotasa*
1.	Oedema	*Kapha*	*Rasa, Rakta, Udaka*	*Rasavaha, Udakavaha*
2.	General Weakness	*Vata*	*Rasa*	*Rasavaha*
3.	Loss of Appetite	*Kapha*	*Rasa*	*Rasavaha, Annavaha*
4.	Nausea/Vomiting	*Kapha*	*Rasa*	*Rasavaha, Annavaha*
5.	Muscle Cramps	*Vata*	*Rasa, Rakta, Mamsa*	*Mamsavaha*
6.	Breathlessness	*Kapha*	*Rasa, Rakta*	*Pranavaha, Rasavaha*

In Ayurveda, the kidneys (*Vrukka*) are considered the foundational organs of the *Medovaha Sarotasa*. They primarily develop from the *Rakta* (blood) and *Meda* (fat) *Dhatus*, and are classified as *Matruja* (inherited) *Avayava* (organs).

Chronic kidney disease (CKD) is not directly mentioned in Ayurveda, but Ayurvedic concepts can be applied to it through *Nidanapanchaka* (the five-fold diagnostic approach). The signs and symptoms of CKD primarily indicate an imbalance in *Vata* and *Kapha Doshas*, along with disturbances in multiple *Doshas*. Initially, there is vitiation in *Rasa* (plasma), *Rakta* (blood), *Mutra* (urine), and *Udaka*

(water), followed by involvement of all *Dhatus* and *Upadhatus* (tissues and sub-tissues). The aggravated *Doshas* and Dhatus circulate through the *Rasa* with *Vyana Vayu*, affecting the *Mutravahasrotasa* (urinary channels), resulting in *Khavaigunya* (dysfunction). The clinical manifestations of *Dosha* disturbance are considered the primary signs of CKD.

Chronic kidney disease (CKD) is a highly complex condition classified as *Vyadhi Sankara.* Its signs and symptoms vary depending on the causative factors and the stage of the disease. The etiological factors contributing to CKD encompass the *Roopavastha*, *Upadrava*, and *Vyadhi Sankara* of the following conditions:

Prameha

In Ayurveda, the term "*Prameha*" refers to a group of disorders characterized by excessive urination (polyuria) and turbid urine. It encompasses conditions such as diabetes mellitus, obesity, and metabolic syndrome.[14] Additionally, certain conditions like nephrotic syndrome are occasionally regarded as variants within this group.[15] The pathogenesis of *Prameha* highlights the localization of vitiated *Doshas* and *Dushyas* in the *Basti*, indicating pathological changes (*Sroto-Vaigunya*) associated with this structure.[16] During this process, *Dosha-Dushya Sammurcchana* (the interaction between vitiated *Doshas* and *Dushyas*) occurs[17], marking the prodromal stage of the disease. A key early symptom related to renal dysfunction is glycosuria[18], observed as urine attracting *Pipilikas*(ants). If the condition advances, it results in the full manifestation of the disease, characterized by increased urine frequency accompanied by turbidity, indicative of polyuria with proteinuria.[19] This stage suggests nephropathy, a late complication of diabetes mellitus. Inadequate or inappropriate management at this stage can render the disease incurable.[20]

Mutraghata

Mutraghata refers to urinary retention accompanied by mild dysuria, caused by anobstruction in the urinary tract. This condition results in either a complete lack of urine excretion or minimal, difficult urination. It arises from the vitiation of *Basti* due to circulating aggravated *Doshas*.[21] Suppression of the urge to urinate in conditions like *Vatabasti*, *Mutratita*, *Mutrajathara*, and *Vatakundalika* leads to urine retention. Direct obstructions such as *Mutragranthi* and *Ashthila* also contribute to urinary retention.

In *Ushnavata*, urinary tract infections cause inflammation, resulting in both retention and dysuria. *Mutrakshaya*, characterized by oliguria due to poor hydration, can impair renal blood flow over time, causing damage to renal cells. *Vidvighata* involves faecal contamination of urine due to rectovesical fistulas. If this contamination ascends to the upper urinary tract, it may lead to infections and renal damage. *Bastikundala* resembles an atonic bladder, leading to urinary retention. In cases of complete obstruction of the urinary tract, symptoms like thirst, delirium, and breathlessness may emerge, resembling uremic syndrome.[22]

Chronic urine retention from these causes leads to urinary stasis, increasing the risk of infections and the formation of urinary calculi, which gradually harm the kidneys.

Probable *Samprapti* of Chronic Kidney Disease

Complicated urinary system disorders and other systemic diseases result in an imbalance of the three *Doshas* (*Tridosha*). *Acharya Sushruta* describes the process of urine formation as a pitcher immersed in water, where the *Doshas* enter the *Basti* (kidneys) in a similar manner, filling it from all sides.[23] These *doshas* impair the function of the kidneys. After digestion, the kidneys separate and differentiate urine as ametabolic by-product for elimination.[24] However, when the kidneys are diseased, they cannot properly differentiate and separate urine, leading to the retention of harmful metabolic waste products in the body, which then circulate and cause systemic harm.[25]

In modern medicine, the pathogenesis of Chronic Kidney Disease (CKD) involves damage to renal cells due to various underlying causes, such as immune complex deposition, inflammation from specific types of glomerular nephritis, or toxin buildup in renal tubules and interstitium. The systemic harm is a result of the accumulation of toxins that would typically be excreted by the kidneys, as well as

complications arising from the loss of other renal functions, such as maintaining fluid and electrolyte balance, hormone regulation, and the progressive systemic inflammation that affects the vascular and nutritional systems.

Clinical features of Chronic Kidney Disease

The 2012 Kidney Disease Improving Global Outcomes (KDIGO) CKD classification recommends specifying the cause of CKD and classifies the condition into 6 categories based on GFR (G1 to G5, with G3 split into 3a and 3b). In addition, it also includes staging based on 3 levels of albuminuria (A1, A2, and A3), with each stage of CKD subcategorized according to the urinary albumin-creatinine ratio (ACR; mg/g or mg/mmol) in an early morning "spot" urine sample.[26]

The 6 CKD categories, known as stages1through 5, are described below (stage 3 is separated into 3a and 3b):

- G1: GFR 90 mL/min/1.73 m^2 and above with evidence of kidney disease, such as haematuria or proteinuria
- G2:GFR60to89mL/min/1.73m^2
- G3a: GFR45to59mL/min/1.73m^2
- G3b: GFR30to44mL/min/1.73m^2
- G4:GFR15to29mL/min/1.73m^2
- G5: GFR less than 15 mL/min/1.73 m^2 or treatment by dialysis

The 3 levels of albuminuria include an ACR:

- A1: ACR less than 30mg/g(<3.4mg/mmol)
- A2: ACR 30 to 299 mg/g(3.4-34mg/mmol)
- A3: ACR greater than 300 mg/g (>34 mg/mmol) Grades 1 and 2 of Chronic Kidney Disease (CKD)

Typically, do not present with noticeable symptoms related to the decline in glomerular filtration rate (GFR). However, symptoms may arise from the underlying kidney disease or other systemic conditions. As GFR declines to grade 3 or 4, the clinical and laboratory complications of CKD become more apparent. CKD impacts nearly all organ systems, but the most common complications include anaemia, leading to easy fatigue, decreased appetite, and progressive malnutrition. There are also disruptions in calcium, phosphorus, and the regulation of minerals like calcitriol and parathyroid hormone (PTH), as well as abnormalities in sodium, potassium, water balance, and acid-base homeostasis. Since CKD represents a complex syndrome with contributions from various diseases, the signs of renal failure often indicate a reduced life expectancy.

Prognosis

The chronic renal insufficiency cohort (CRIC) study is an observational study that began in 2001 and is still ongoing in the fifth and final phase. The CRIC study examined risk factors for the progression of CKD and CVD (cardio vascular disease) among nearly 5500 patients. The study enrolled adults aged 21 to 74 with a broad range of renal disease severity and eGFR between 20 and 70 mL/min/1.73 m2. About half the patients had concurrent diabetes. Measures of kidney function and occurrence of new and worsening CVD were primary endpoints, and they have yielded valuable data on a variety of other significant associations.[27,28]

The CRIC study showed that CKD progression was correlated with cognitive decline, cardiovascular mortality, left ventricular hypertrophy, coronary artery calcification, and clinical depression, among other associations.[27]

In Ayurveda, understanding the prognosis of a disease differentiating between curable and incurable conditions is essential for an effective physician. Chronic Kidney Disease (CKD), being a disorder of a vital organ and in an advanced state, is classified based on its stages. In the early stages (stages 1 and 2), it is considered *Kricchasadhya* (difficult to treat). Stages 3 and 4 are regarded as *Yapya* (manageable with palliation), as significant kidney cell damage and biochemical disturbances occur. At this point, adherence to a strict regimen is crucial to prevent progression. Stage 5, or end-stage renal disease, presents with uremic symptoms and is deemed incurable and beyond mitigation, as it affects all

organ systems, leads to wide spread destructive effects, and is associated with a poor prognosis and fatal out comes.[29]

Management

Modern treatment of CKD focuses on addressing its underlying causes. Addressing factors that contribute to the progression of Chronic Kidney Disease (CKD), such as hypertension, proteinuria, metabolic acidosis, and hyperlipidemia, is essential. Hypertension should be managed according to recommended blood pressure targets, and efforts should be made to reduce proteinuria to below 1g/day when possible.[30]

Research has consistently shown that smoking increases the risk of nephrosclerosis, while smoking cessation helps slow CKD progression.[31] Protein restriction has also been found to decelerate disease progression; however, patients with advanced CKD are prone to malnutrition, highlighting the importance of dietary guidance from a nutritionist.

Bicarbonate supplementation to manage chronic metabolic acidosis has been shown to slow CKD progression.[32] Furthermore, in individuals with diabetes, strict glucose control has proven effective in delaying the onset of albuminuria and preventing its progression to overt proteinuria.[33]

Ayurvedic Approach

Primary Goals of Treatment

1. To slow the progression of the disease
2. To address the underlying causes and contributing factors.
3. To manage the complications of the disease
4. To restore lost kidney function

Treatment Protocol

1. *Nidana parivarjana*: Avoidance of causative factors related to diet (*Ahara*) and lifestyle (*Vihara*).

2. *Lekhana* and *Mutravaha Srotasa Rasayana*: Useful for repairing and enhancing the function of the affected organ.

3. *Shodhana Karma*: Supporting the body's excretory functions through detoxification processes.

The main goal of Ayurveda is to promote health in healthy individuals, with the treatment of illness being secondary. Ayurveda provides a holistic approach to the treatment of Chronic Kidney Disease (CKD). The first and most important recommendation is to eliminate the causative factors (*Nidana Parivarjana*). The management of systemic imbalances (*Bheshaja Chikitsa*) focuses on improving *Jathragni* to address *Amotpatti* and remove *Srotorodha*. Treatment can include both *Shamana Chikitsa* (palliative therapy) and *Shodhana Chikitsa* (detoxification therapies).

According to *Acharya Sushruta*, the kidneys (*Vrukka*) are formed from the *Rakta* and *Meda Dhatu*. *Ahara* (food) is converted into *Rasa Dhatu*, which then transforms into the other *Dhatus*, including *Rakta*. Therefore, the treatment should focus on correcting *Jathragni*, which strengthens the *Dhatwagni* (digestive fires), leading to the formation of high-quality *Rasadi Dhatu.* The use of herbal drugs that specifically act on *Rakta* and *Meda Dhatus* is also crucial to nourish the kidneys. After the palliative treatment (Shamana Chikitsa) reduces signs of weakness (*Daurbalya*) and tissue depletion (*Dhatu Kshaya*), the patient can be administered gentle purgation (*Mrudu Virechana*) and *Basti* (medicated enemas).

Ayurveda highlights the critical importance of *Trimarma-Sira*, *Hrudaya*, and *Basti*-as essential structures that must be safeguarded to prevent life- threatening consequences. While the *Basti Marma* is anatomically associated with the bladder, it encompasses the entire renal function, with the kidneys playing a pivotal role. Given that *Basti Marma* is impacted in CKD, and recognizing the significance of *Marma* protection (*Marma Paripalana*), *Basti Karma* emerges as a preferred therapeutic approach for managing the condition.

DRUG REVIEW

PUNARNAVADI KWATH:

The classical preparation is mentioned in ***SHARANGDHAR MADHYAM KHANDA.*** The contents of *Punarnavadi Kwath* are *Punarnava, Abhaya, Nimba, Daruharidra, Katuki, Patola, Guduchi, Shunthi.*

पुनर्नवाभयानिम्बदार्वीतिक्तापटोलकैः ।

गुडूचीनागरयुतैः क्काथो गोमूत्र संयुतः ।

पाण्डुकासोदरश्वासशूलसर्वाङ्गशोथहा ।।

(शा. सं. म. ख. 2/76-77)

अर्थात् पुनर्नवा, हरीतकी, निम्ब, दारुहरिद्रा, कटुकी, पटोलपत्र, गुडूची और शुण्ठी का क्काथ गोमूत्र मिलाकर पीने से पाण्डु, कास, उदररोग, श्वास, शूल तथा सर्वाङ्गशोथ को नष्ट करता है।

Table 2: Contents of *Punarnavadi Kwath*

S.N.	DRUG	RATIO	PART USED
1	*Punarnava*	1PART	Whole plant
2	*Haritaki*	1PART	Fruit pericarp
3	*Nimba*	1PART	Root bark
4	*Daruharidra*	1PART	Root
5	*Katuki*	1PART	Root
6	*Patola*	1PART	Whole plant
7	*Guduchi*	1PART	Root, Stem, Leaf
8	*Shunthi*	1PART	Rhizome

***PUNARNAVA*[34,35]**

Botanical Name: *Boerhavia diffusa* (Linn.)
Family: *Nyctaginaceae*
Synonyms:
Sanskrit: *Punarnava, Rakta Pushpa, Shilaatikaa, Kshudravarshabhu, Varshaketu, Kathillaka*
Hindi: *Gadapurna, Thikari, Sant, Biskhafra*
English: Spreading Hogweed
Chemical constituents:

Punarnavoside, Boeravinones A, B, C, D and E, liridodendrin, syringaresinol mono- β-D glucoside, flavones, sterols, isofuroxanthone, boeravine, hypoxanthine-9-Larabinofuranoside.

Pharmacological Activities:

Diuretic, anti-inflammatory, antiviral, anticonvulsant, cardiotonic, antihypertensive, hepatoprotective,

antibacterial, significant antifibrinolytic.
Therapeutic Use:

Shotha, Netra Roga, Agnimandhya, Vibandha, Udararoga, Hridroga, Pandu, Kasa, Swasa, Urahkshata, Raktapradara, Mutrakrichchhra, Kushtha, Jwara

DARUHARIDRA[36,37]

Botanical name: *Barberis Aristate Dc*.
Family: *Berberidaceae*
Synonyms:
Sanskrit: *Daruharidra*, *Darvi, Darurajani, Darhald*
Hindi: *Daru Haldi*
English: Indian beriberi
Chemical constituents:
Berrberine, berbamine, oxycanthine, epiberberine, palmatine, dehydrocaroline, jatrorrhizine and columbamine
Pharmacological activities:

Anti-Microbial, Anti-Inflammatory, Analgesic, Anti- Pyretic, Hepatoprotective, Immunomodulatory and Cardiotonic Activity.
Therapeuticuses:

Shothahara, Vedanasthapana, Vrana Shodhana, Deepan

KATUKI

Botanical name*: Picrorhiza curroa*
Family*: Scrophulariaceae*
Synonyms:
Sanskrit: *Katuka*, *Tikta* (bitter in taste), *Katu rohini*, *Shakuladani*
Kandaruha, *Matsya Shakala* (Stem bark resembles skin of fish),
Chakrangi (has circular designs)
Krushnabheda (when broken, the root looks dark inside),
Shataparva (multi branched), *Ashoka, Katumbhara, Katvi*
Rohini – (Purifies blood, improve functions of liver, act as regenerative)
Hindi Name- *Kutki*, *Katuka*
English Name- Picrorrhiza, Hellebore, Yellow gentian, Picroliv
Chemical Constituents:
Pircorhiza kurroa chemical constituents are D-Mannitol, Kutkiol, Kutkisterol, Apocyanin: phenol glucosides; androsim and piceiniridoid glycosides; Kutkin, picroside I, ii & iii; Kutkoside, Minecoside, Picrorhizin, arvenin ili etc. Phyto-chemical study reveals the chemical composition of Picrorhiza kurroa to include Kutkin, a bitter glycoside which contains two C-9 iridoid glycosides-Picroside-I and Kutakoside.
Pharmacological Activities:

Cytoprotection, Anti-HBsAg activity, Anti-anaphylaxis, Antileishmanial, Antifungal Activity, Anti-diabetic, Anti-diabetic, Anticancer, Immunomodulatory, Antioxidant and anti-neoplastic, Hepatoprotective.

Therapeutic Use*:*

Pramehaghna, Stanyashodhan, Kaphanihsaraka, Kaphaghna, Kushthaghna, Dahaprashamana, Vishamjwaraghna, Lekhneeya, Hrudaroga, Shotharoga,

***SHUNTHI*[38,39]**

Botanical Name: *Zingiber Officinale Roxb*
Family: *Zingberaceae*
Synonyms:
Sanskrit*: Shunthi, Vishva, Nagar, Vishvabhesahj, Ushana, Katubhadra, Shringbher, Mahaushadha*
Hindi: *Sonth*
English: Ginger
Chemical constituents:

Heptane, Octane, Isovaleraldehyde, Nonanol, Camphene, Myrecene, Limonene, Gingerol, Zingerone, Shogaol, Dihydroingerol (Essential Oil), 6-Ginge- SulphonicAcid, GingerglycolipidsA, BandC, Monoacyl- Di galactosyl glycerols (Rhizomes), Dehydrogingerdione, Gingerdione and Gingerol (Root), Aspartic Acid, Threonine, Serine, Glycine, Cysteine, Valine, Isoleucine, Leucine and Arginine (Aerial Parts and Tuber).
Pharmacological Activities:

Anti-inflammatory, Hypolipidaemic, Antiatherosclerotic, Antiemetic, Antiulcer, Antiplatelet, Antipyretic, Cardiovascular, Antioxidant, Antibacterial, Antifungal, Antitumoral, Carbonyl Reductase Activity, Antiserotoninergic, Antirhinoviral, Hypouricemic, Analgesic, Antidepressant, hepatoprotective, Hypoglycaemic, Inotropic.
Therapeutic Use:

Agnimandhaya, Pandu, Adhaman, Swasa, Udararoga, Amavata.

***HARITAKI*[40,41]**

Botanical Name: *Terminalia chebula* Retz.
Family: *Combretaceae*
Synonyms:
Sanskrit: *Haritaki, Abhaya, Pathaya, Kaystha, Putana, Amrita, Hemavati, Avyatha, Chetaki, Shreyashi, Shiva, Vyastha, Vijaya, Jivanti, Rohini*
Hindi: *Harada, Harre*
English: Myrobalan
Chemical constituents:
Tannins, Anthraquinones and Polyphenolic Compound.
Pharmacological Activities:

Immuno Modulatory Activity: Ethanolic extracts study confirms the immune modulatory activity of ripe T. *Chebula* fruits as evidenced by the increase in the concentration of antioxidant enzymes, T and B cells, the proliferation of which play important roles in immunity. This phenomenon also enhances the concentration of melatonin in the pineal gland as well as the levels of cytokines.
Antioxidant Activity: Methanol Extract, water extract,
95 % ethanol extracts were used comparisons of antioxidant activities between unfermented extracts and fermented products are demonstrated for the first Time. The antioxidative pattern plots revealed valuable information and showed good correlation between scavenging effect on DPPH radical assay and hrp-luminol-H2O2 assay.
Therapeutic Use:

Vibanda, Aruchi, Udavarta, Gulama, Udararoga, Arsaha, Pandu, Shotha, Jirnajavara, Visamajavara, Parmeha, Siroroga, Kasha, Tamaka Swasa, Hridroga

***GUDUCHI*[42,43]**

Botanical Name: *Tinospora cordifolia (Willd.)*

Family: *Menispermaceae*
Synonyms:
Sanskrit: *Guduchi, Madhuparni, Amrita, Amritavallari, Chhinnaruha, Chhinodbhavaa, Vatsadani, Jeevanti, Tantrika, Soma, Somavalli, Kundali, Chakralakshanika, Dheera, Vishalya, Rasayani, Vayastha, Mandali, Devnirmita, Chhinna, Chandrahaasaa*
Hindi: *Giloy*
English: Heart leaved moon seed
Chemical constituents:

Tinosporin, tinosporon, tinosporic acid, tinosporol, tinosporide, tinosporidine, columbin, chasmanthin, palmarin, berberin, giloin, giloinisin, cordifolide, Tinisporidine, β-sitosterol, Cordifol, Hepacosanol, octacosanol, Isocolumbin, Tetrahydropalmatine, Magnoflarine, Palamatine
Pharmacological Activities:

Hypoglycaemic, CNS depressant, antibacterial, antimicrobial, antipyretic, anti-inflammatory, anti-arthritic, antiallergic, hepatoprotective, analgesic, immunosupportive, antineoplastic, antidiabetic, antitumour, adaptogenic, antioxidant, antiendotoxic, hypotensive, diuretic.
Therapeutic Use:

Kushtha, Vatarakta, Trishna, Daha, Chhardi, Aruchi, Agnimandhya, Shola, Yakridvikara, Kamala, Amlapitta, Pravahika, Atisara, Raktavikara, Amavata, Pandu, Swasa, Kasa, Shukradaurbalya, Prameha, Madhumeha, Mutrakrichchhra, Kushtha, Visarpa, Twakroga, Jwara, Vishamajwara, Jeernajwara

PATOLA

Botanical name: *Trichosanthes dioica*
Family name*:* *Cucurbitaceae*
Synonyms:
Sanskrit:
Patola, *Kulaka*,
Karkashacchada - Leaves have rough surface
Rajiphala - Fruits have white stripes on its surface
Kulaka - It is aphrodisiac
Beejagarbha - The hollow part of fruit possesses seeds
Pancha Rajiphala, *Amrutaphala*, *Panduphala*, *Tiktottama*, *Naga Phala*
Hindi: *Parval*
English: Pointed guard
Chemical constituents:
Total plant contain meso - inositol, beta sitosterol
Seed oil contains punicic acid, Free fatty acids like oleic, linoleic, palmitic, stearic and arachidic acid
Pharmacologic activities

External Application - Wound cleanses the wounds and promotes fast healing. Promote hair growth. It has Analgesic action. Root paste is indicated in headache. In wounds and Baldness its leaf juice is beneficial for external application.
Internal administration-
Digestive system - Carminative, Digestive, Improves taste, facilitates movement of doshas in the proper direction, purgative in nature. Indicated in Helminthiasis, Loss of appetite, Anorexia, Excessive thirst, Jaundice and other liver disorders, Acid reflux disorders etc.
Circulatory System - Blood purifier. Indicated in edema, bleeding disorders.
Respiratory system - Pacifies *Kapha* dosha. Indicated in cough
Tvak - indicated in itching associated skin diseases.
Tapakrama - Indicated in fever (*jirna jvara* and *pitta jvara*)

Satmikarana - Anti poisonous. Indicated in general debility.
Therapeutic uses*:* *Agnideepaka, Grahi, Deepana, Pachaka, Rochana, Krimighna, Jwaraghna, Kushtaghna, Vishaghna*

NIMBA

Botanical name: *Azadirachta indica*
Family: *Meliaceae*
Synonyms:
Sanskrit*: Arishta*, *Pakvakrita*, *Nimbaka*
Hindi: Neem
English: Margosa tree
Chemical Constituents:

Nimbin, Nimbinin, Nimbidin, Nimbosterol, Tannins
Pharmacologic activities:

Immune Modulatory, Anti-Inflammatory, Anti Hyperglycaemic, Antiulcer, Antimalarial, Antifungal, Antibacterial, Antiviral, Antioxidant, Antimutagenic, Antidiabetic and Anticarcinogenic Properties

Therapeutic uses:

Pitta and *Kapha Doshahara, Vidradhi, Granthi, Vrana, Grahni, Krimi, Yakritvikar, Raktavikara, Madhumeha, Bahumutrata, Jwararoga*

Table 3: *Rasa Panchaka* of Contents of *Punarnavadi Kwath*

SN	Drug	*Rasa*	*Guna*	*Veerya*	*Vipaka*	*Doshghnata*	*Karma*	Useful Part
1.	*Punarnava*	*Madhura, Tikta, Kashyaya*	*Laghu, Ruksha*	*Ushana*	*Madhura*	*Tridoshashamka*	*Shothahara, Lekhana, Deepana, Anulomana, Rechana, Hridhaya, Raktavardhaka, Rasayana*	Whole Plant
2.	*Haritaki*	*Kaṣaya, Amla, Madhura, Tikta, Kaṭu*	*Ruksha, Laghu*	*Ushna*	*Madhura*	*Tridoshaghana*	*Sarvadoshaprashamnama, Chakshusaya, Rasayana, Deepana, Anulomana, Hridaya, Medaya*	Fruit Pericarp
3.	*Nimba Moola Twaka*	*Tikta, Kashyaya*	*Laghu,*	*Sheeta*	*Katu*	*KaphaPitta Shamak*	*Vatla, pitnashak, grahi.*	Root Bark
4.	*Daru Haridra*	*Katu, Tikta*	*Laghu, Ruksha*	*Ushna*	*Katu*	*Kapha-Vatahara*	*PacifiesVata*and *Kapha*promotes*Pitta*	Root
4.	*Katuki*	*Tikta*	*Ruksha Laghu,*	*Sheeta*	*Katu*	*Kapha-Pittahara*	*Visham Jwara Hara, Bhedaniya, Rechniya, Deepaniya, Arochakhara, Prameha, Swasa Kasahara,*	*Root*
5	*Patola*	*Tikta*	*Laghu, Ruksha*	*Ushna*	*Katu*	*Tridosha Shamaka*	*Agnideepaka, Grahi, Deepana, Pachaka, Rochana, Krimighna, Jwaraghna, Kushtaghna, Vishaghna*	*Patra*
6.	*Guduchi*	*Kashaya, Tikta*	*Guru, Snigdha*	*Ushana*	*Madhura*	*Tridoshashamaka*	*Vedanasthapana, Kushthghna, Chhardinigrahna, Hridhya, Deepana, Pachana, Pittasaaraka, Anulomana, Samgrahi, Krimighna, Hridhya, Raktashodhaka, Raktavardhaka, Vrishya, Dahaprashamana, Balya, Mutrajanana, Jwaraghna, Trishnaanigrahana, Rasayana*	Root, Stem, Leaf
8.	*Sunthi*	*Kaṭu*	*Laghu, Snigdha*	*Ushana*	*Madhura*	*VataKaphahara*	*Deepana, Pachana, Anulomana, VataKaphahara, Hridaya*	*Rhizome*

METHODOLOGY

This prospective observational study was conducted at the Mahaveer College of Ayurvedic Science Hospital, Sundra, Rajnandgaon, Chhattisgarh The study aimed to observe and evaluate the effects of *Punarnavadi Kwath* as an adjuvant therapy in patients with Chronic Kidney Disease who were already undergoing routine hemodialysis. The study included sample size of 50 participants (Group A and Group B, 25 participants in each).

Objectives:

1. **Primary Objective:** To assess the effect of *Punarnavadi Kwath* on renal function parameters in hemodialysis patients, specifically by monitoring changes in serum creatinine and blood urea levels and GFR during the study period.
2. **Secondary Objectives:**
    - To evaluate the impact of *Punarnavadi Kwath* on the frequency and severity of symptoms associated with kidney disease, such as fatigue and edema.
    - To observe its potential role in managing complications associated with hemodialysis, including hypotension and anemia.
    - To examine patient-reported quality of life and overall well-being using standardized questionnaires administered before and after the observation period.

Study Design and Patient Selection:

Patients fulfilling predefined inclusion criteria were meticulously selected from both the In-patient Department (IPD) and Out-patient Department (OPD) of Kayachikitsa. Each eligible participant underwent an extensive history taking before being registered for the observational study.

The study design is as follows:

- **Study type:** Observational
- **Purpose:** To evaluate the efficacy of *Punarnavadi Kwath*
- **Timing:** Prospective
- **Masking:** Open trial
- **Sample size:** 50 (total)
- **Number of groups:** Two groups
    - **Group A:** Received *Punarnavadi Kwath* alongside Hemodialysis.
    - **Group B:** Received Hemodialysis (without *Punarnavadi Kwath*).
- **Selection of cases:** OPD/IPD
- **Sample population:** Patients from Mahaveer College of Ayurvedic Science Hospital, Sundra, Rajnandgaon-491441, Chhattisgarh, India

- **Duration of trial:** 6 weeks

Intervention and Observation Period:

The study was conducted over a six-week intervention and observation period, during which participants in two distinct groups received their respective treatments. Group A participants continued their existing regimen of *Punarnavadi Kwath* at a dose of 30 ml, orally, three times daily before meals. Concurrently, these patients maintained their prescribed routine hemodialysis sessions in accordance with standard medical guidelines. Group B participants, serving as the control, received only their routine hemodialysis sessions and standard medical care, without the administration of *Punarnavadi Kwath*.

Data Collection and Assessment:

A comprehensive assessment of each patient was performed both at baseline (at the start of the observation period) and after the six-week period. Symptomatic improvements were evaluated using a specially prepared grade score. Objective efficacy was further ascertained through standard laboratory investigations, including measurements of serum creatinine, blood urea, and estimated Glomerular Filtration Rate (eGFR) values and also *Mutravarodha* (obstructed Micturition), *Mutrakruchra* (difficulty micturition), *Mutradaha* (burning micturition), *Mutralpata* (Oliguria), Anorexia, Thirst, Vomiting, Oedema, Nocturia, Pruritis, Dyspnoea, Dozing&, Sleepiness, Anaemia. Quality of life and overall well-being were collected using standardized questionnaires.

Statistical Analysis:

The obtained data were subjected to rigorous statistical analysis using the Paired Sample ‘t’ Test to determine the significance of changes observed in the symptomatic grade scores, laboratory parameters, and quality of life indicators before and after the observation period.

OBSERVATION AND RESULTS

The therapeutic potential of ***Punarnawadi Kwath*** has been evaluated in a study involving 50 patients (Group A and Group B, 25 patients each) from the outpatient and inpatient departments of the 'Kayachikitsa department at Mahaveer College of Ayurvedic Science Hospital, Sundra Rajnandgaon, Chhattisgarh.

1. DISTRIBUTION OF PATIENTS IN RELATION TO AGE GROUPS

The patients were categorized into different age groups. The highest incidence of Chronic Kidney Disease (CKD) was observed in the 51-70 years age group, accounting for 46%, while the lowest incidence was found in the 18-30 years age group, representing 12%.

Table 4: Distribution of patients in relation to age groups

Age	Group A	Group B	Total	Percentage
18-30	2	4	6	12%
31-50	9	12	21	42%
51-70	14	9	23	46%
	25	25	50	100%

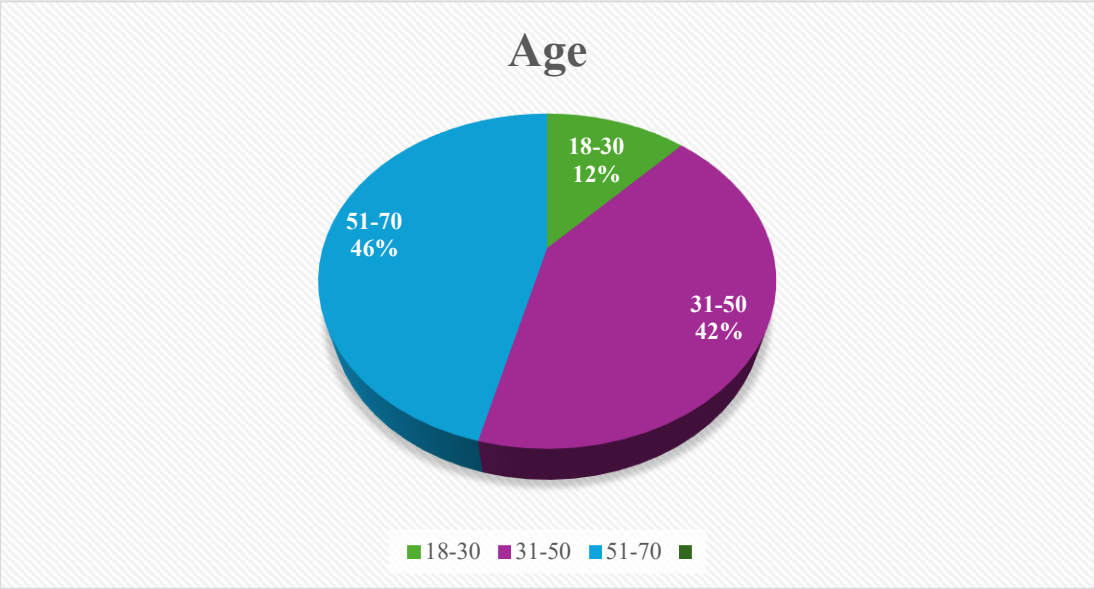


Fig 1. Distribution of patients in relation to age groups

2. DISTRIBUTION OF PATIENTS ACCORDING TO GENDER

Among the 50 patients studied, 32 (64%) were male and 18 (36%) were female. The current study indicates a higher prevalence of Chronic Kidney Disease (CKD) in males compared to females.

Sex	Group A	Group B	Total	Percentage
Male	17	15	32	64%
Female	8	10	18	36%
	25	25	50	100%

Table 5: Distribution of patients according to gender

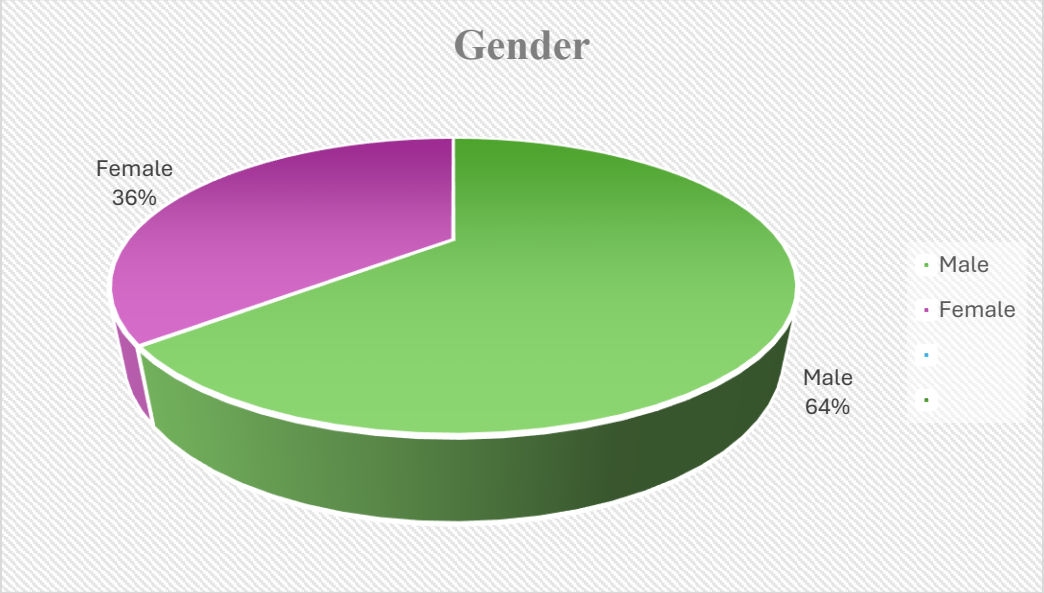


Fig 2. Distribution Of Patients According To Gender

3. DISTRIBUTION OF PATIENTS ACCORDING TO MARITAL STATUS

Among the 50 patients studied, the majority of patients, specifically 43 (86%) are married while 7 (14%) are unmarried.

Table 6: Distribution of patients according to marital status

Marital Status	Group A	Group B	Total	Percentage
Married	21	22	43	86 %
Unmarried	4	3	7	14 %
	25	25	50	100%

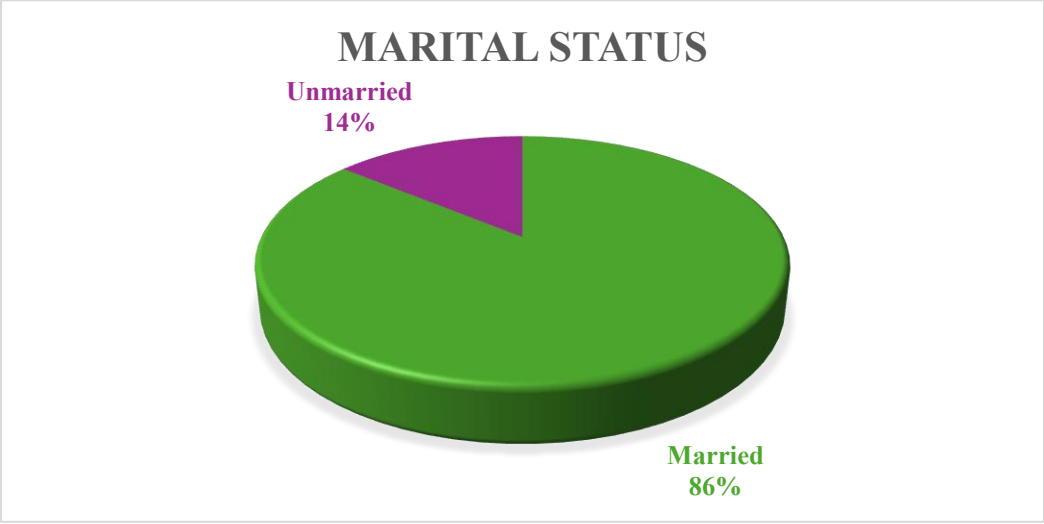


Fig 3. Distribution of patients according to marital status

4. DISTRIBUTION OF PATIENTS ACCORDING TO EDUCATION –

The education levels have been divided into the following categories: illiterate, primary school, secondary school, higher secondary school, senior secondary school, graduate, and post-graduate groups.

The number of individuals and their corresponding percentages are as follows: illiterate 12 (24%), primary school 3 (6%), secondary school 3 (6%), higher secondary school 7 (14%), senior secondary school 5 (10%), graduate 18 (36%), and post-graduate 2 (4%).

Table 7: Distribution of patients according to education

Education	Group A	Group B	Total	Percentage
Illiterate	8	4	12	24 %
Primary School	1	2	3	6 %
Secondary School	1	2	3	6 %
Higher Secondary School	3	4	7	14 %
Senior Secondary School	3	2	5	10 %
Graduate	8	10	18	36 %
Post-graduate	1	1	2	4 %
	25	25	50	100%

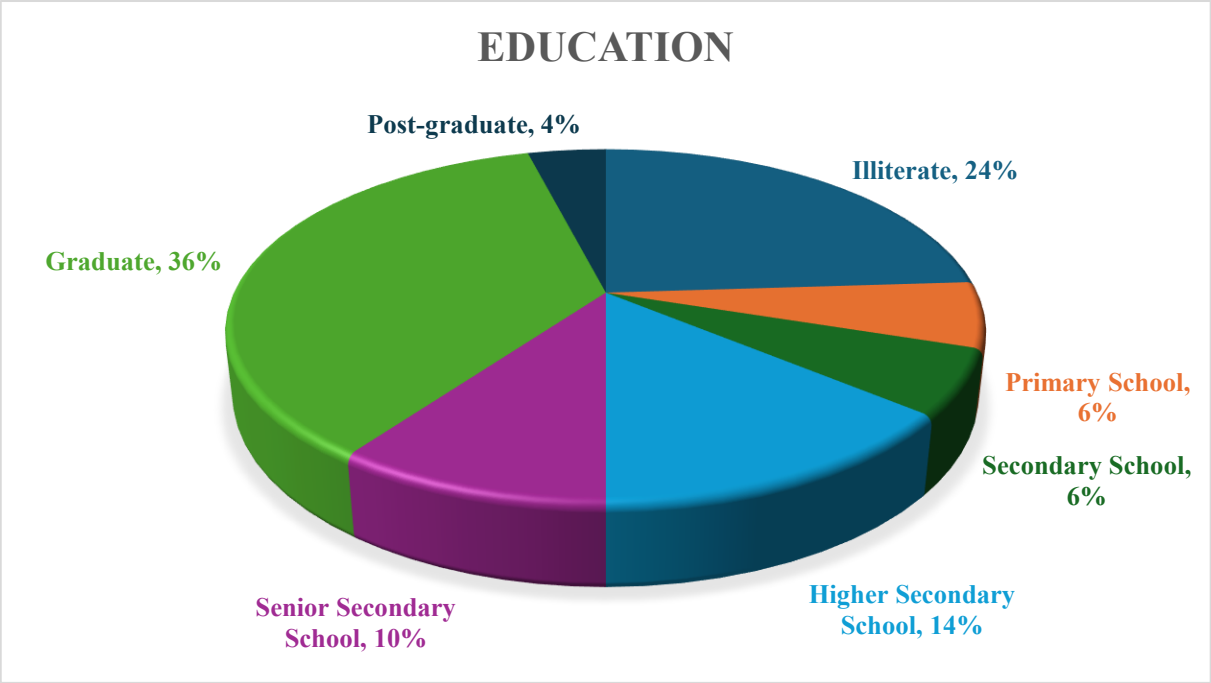


Fig. 4. Distribution of patients according to education –

5. DISTRIBUTION OF PATIENTS ACCORDING TO SOCIOECONOMIC STATUS

The majority of the study participants, specifically 24 individuals (48%), were from the above poverty line group, while 26 participants (52%) belonged to the below poverty line group.

Table 8: Distribution of patients according to socioeconomic status

Socio-economic Status	Group A	Group B	Total	Percentage
APL	13	11	24	48 %
BPL	12	14	26	52 %
	25	25	50	100%

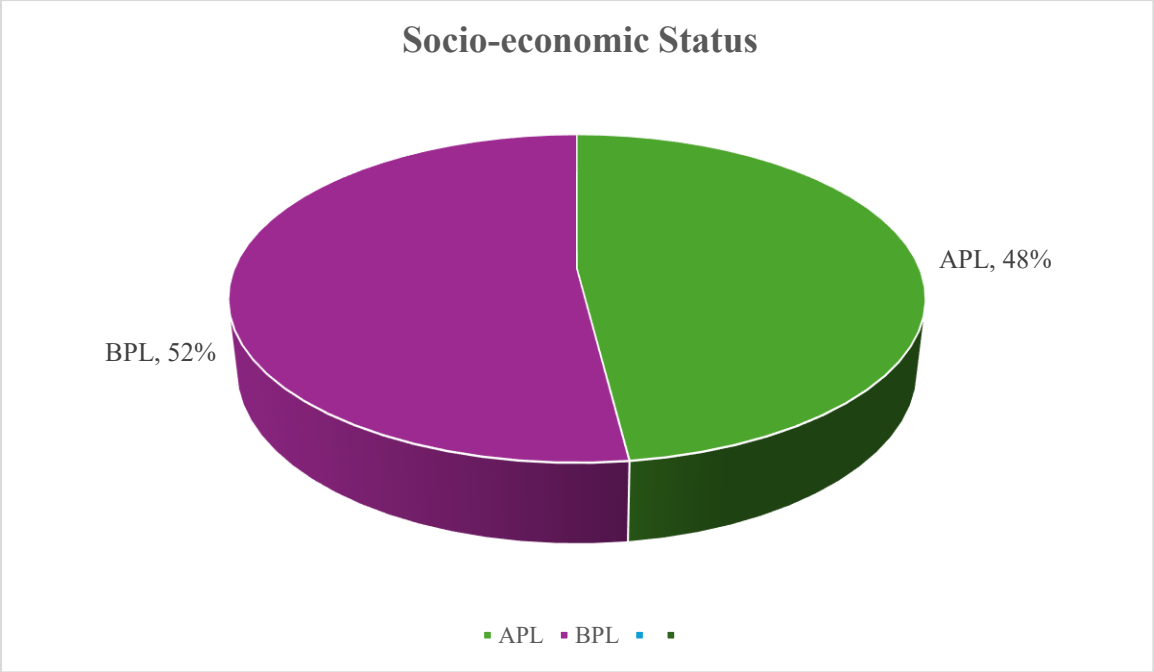


Fig. 5. Distribution of patients according to socioeconomic status

6. DISTRIBUTION OF PATIENTS ACCORDING TO HABITAT

The distribution of study participants was as follows: 17 participants (34%) were from rural areas, another 13 participants (26%) were from semi-urban areas, and 20 participants (40%) were from urban areas.

Table 9: Distribution of patients according to habitat

Habitat	Group A	Group B	Total	Percentage
Rural	9	8	17	34%
Semi-Urban	9	4	13	26%
Urban	7	13	20	40%
	25	25	50	100%

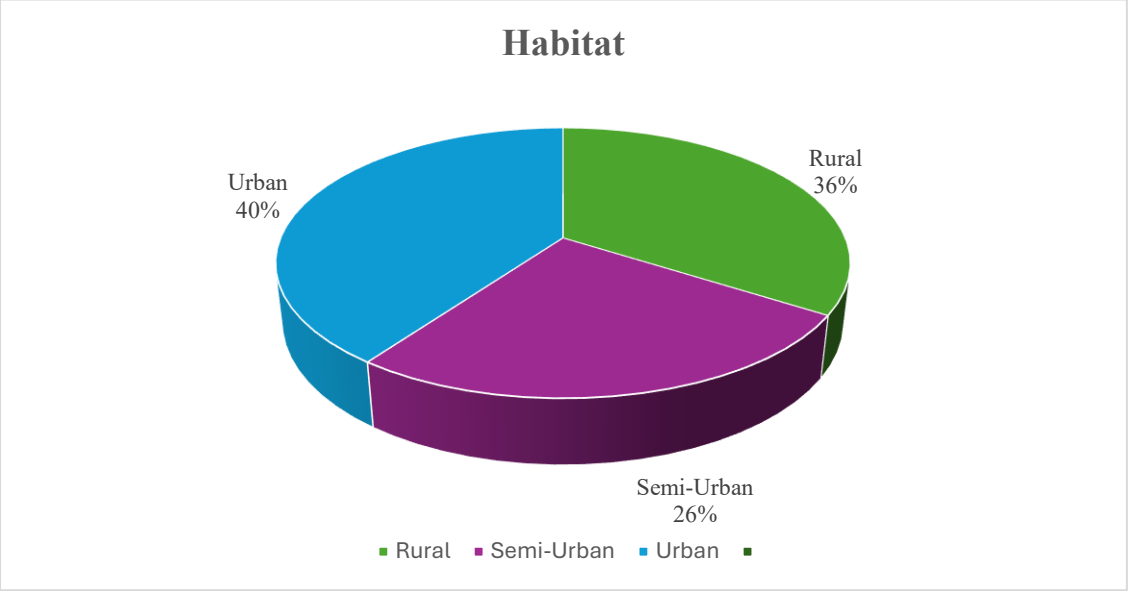


Fig. 6. Distribution of patients according to habitat

7. DISTRIBUTION OF PATIENTS ACCORDING TO AHARA (TYPE OF DIET)

The majority of the study participants, 28 individuals (56%), were vegetarian, while 22 participants (44%) followed either a non-vegetarian or mixed diet.

Table 10: Distribution of patients according to ahara (type of diet)

Ahara (Type of diet)	Group A	Group B	Total	Percentage
Samisha (Non-Vegetarian)	9	13	22	44%
Nirmisha (vegetarian)	16	12	28	56%
	25	25	50	100%

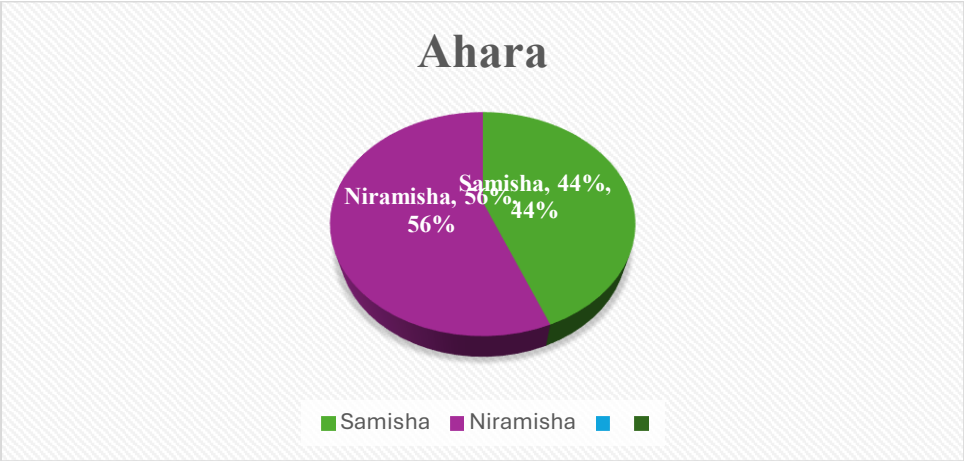


Fig. 7. Distribution of patients according to *Ahara* (Type of diet)

8. DISTRIBUTION OF PATIENTS ACCORDING TO *AHARA VIDHI*

The majority of the study participants, specifically 31 individuals (62%), had a history of *Adhyashana*, while 19 participants (38%) had a history of *Vishamashana*.

Table 11: Distribution Of Patients According To *Ahara Vidhi*

Ahara Vidhi	Group A	Group B	Total	Percentage
Adhyashana	16	15	31	62%
Vishamashana	9	10	19	38%
	25	25	50	100%

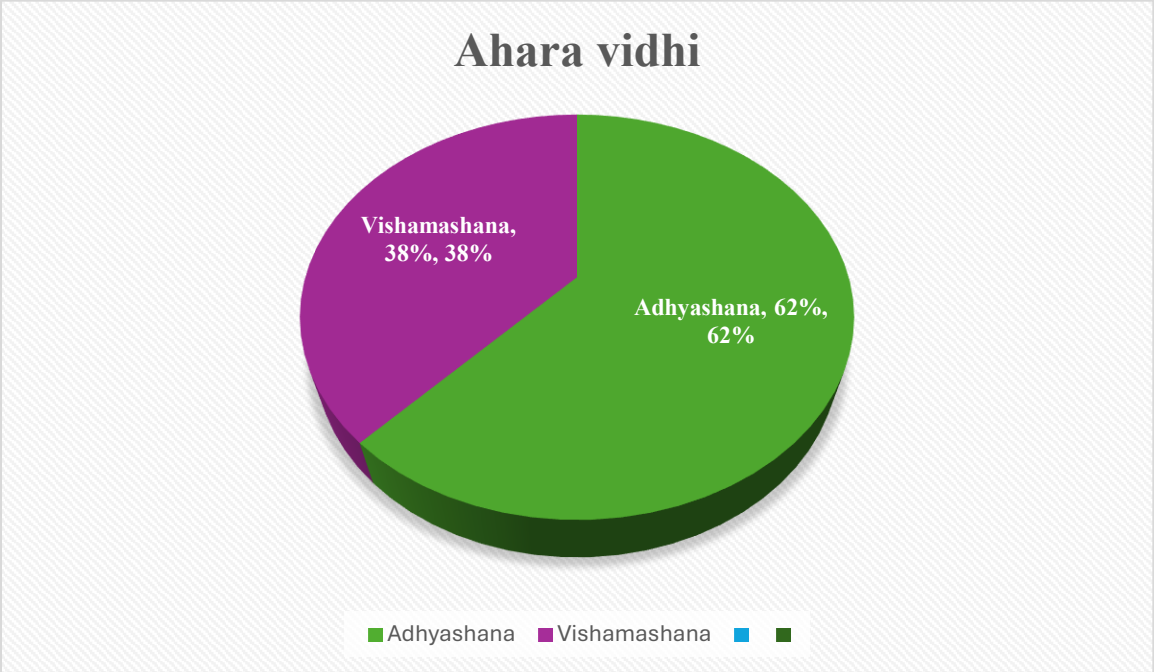


Fig. 8. Distribution of patients according to Ahara Vidhi

9. DISTRIBUTION OF PATIENTS ACCORDING TO AGNI (DIGESTIVE FIRE)

The study found that 19 (38%) of patients had a history of *Tikshana Agni*, 24 (48%) of patients had a history of *Samaagni*, and 7 (14%) of patients had a history of *Mandaagni*.

Table 12: Distribution of patients according to Agni (digestive fire)

Agni	Group A	Group B	Total	Percentage
Tikshana	11	8	19	38%
Sama	11	13	24	48%
Manda	3	4	7	14%
	25	25	50	100%

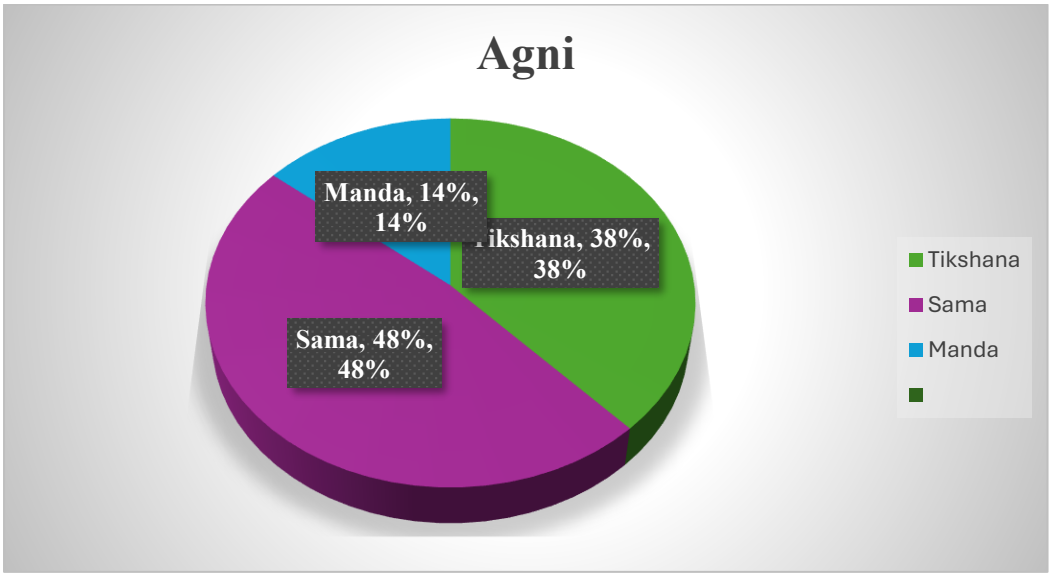


Fig. 9. Distribution of patients according to Agni (digestive fire)

10. DISTRIBUTION OF PATIENTS ACCORDING TO KOSHTHA-

Koshtha refers to bowel habits that are influenced by *Prakriti* (constitution). Constitution signifies the nature of bowel habits from birth. In the study, 40 subjects (80%) were identified with *Madhyama Koshtha*, 7 subjects (14%) with *Mridu Koshtha*, and 3 subject (6%) with *Krura Koshtha*

Table 13: Distribution Of Patients According To Koshtha

Koshtha	**Group A**	**Group B**	**Total**	**Percentage**
Madhyam	21	19	40	80%
Mridu	3	4	7	14%
Krura	1	2	3	6%
	25	25	50	100%

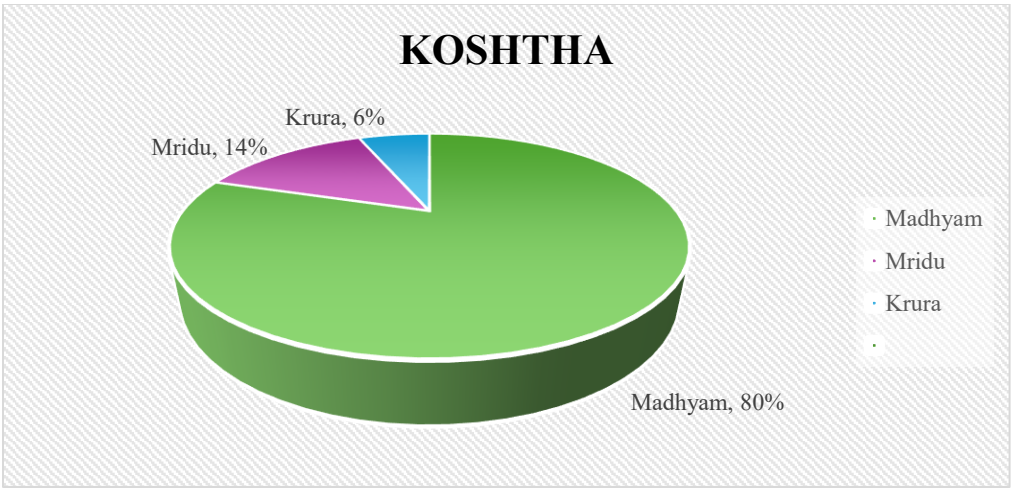


Fig. 10. Distribution of patients according to *Koshtha*-

11. DISTRIBUTION OF PATIENTS ACCORDING TO SLEEP PATTERN-

The study indicates that 26 patients, representing 52%, had a history of disturbed sleep. Additionally, 19 patients, accounting for 38%, reported a history of sound sleep, while 5 patient (10%) had a history of insomnia.

Table 14: Distribution of patients according to sleep pattern

Sleep	Group A	Group B	Total	Percentage
Sound	10	9	19	38%
Disturbed	14	12	26	52%
Insomnia	1	4	5	10%
	25	25	50	100%

Fig. 11. Distribution of patients according to sleep pattern-

12. DISTRIBUTION OF PATIENTS ACCORDING TO PSYCHE/SATVA

Out of the total patients, 28 (56%) had a normal psyche, while 13 (26%) had a history of tension and another 10 (20%) had a history of anxiety.

Table 15: Distribution of patients according to psyche/satva

Psyche/*Satva*	Group A	Group B	Total	Percentage
Tension	5	8	13	26%
Normal	15	13	28	56%
Anxiety	5	5	10	20%
	25	25	50	100%

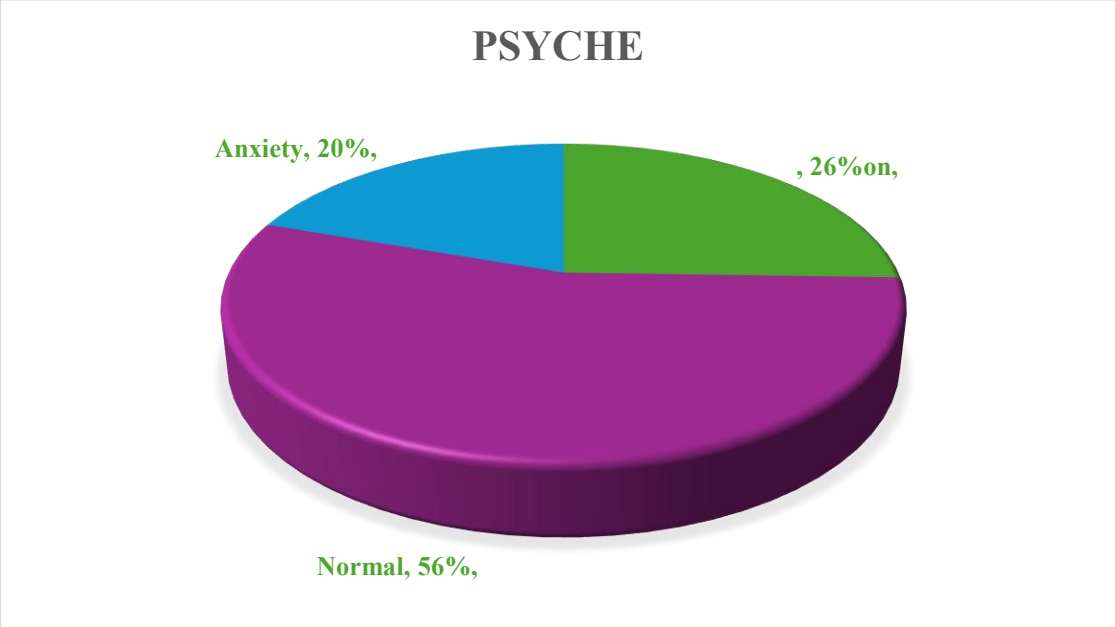


Fig. 12. Distribution of patients according to Psyche/Satva

13. DISTRIBUTION OF PATIENTS ACCORDING TO ADDICTION

The majority of patients, specifically 30 (60%), were addicted to tea. Additionally, 10 (20%) patients had an addiction to both tea and smoking, while 5 (10%) were addicted to tobacco. Furthermore, 4 (8%) patient was addicted to tea and tobacco, along with other substances respectively.

Table 16: Distribution of patients according to addiction

Addiction	Group A	Group B	Total	Percentage
Nil	1	0	1	2%
Tea	16	14	30	60%
Tea & Smoking	4	6	10	20%
Tobacco	3	2	5	10%
Tea & Tobacco	1	3	4	8%
	25	25	50	100%

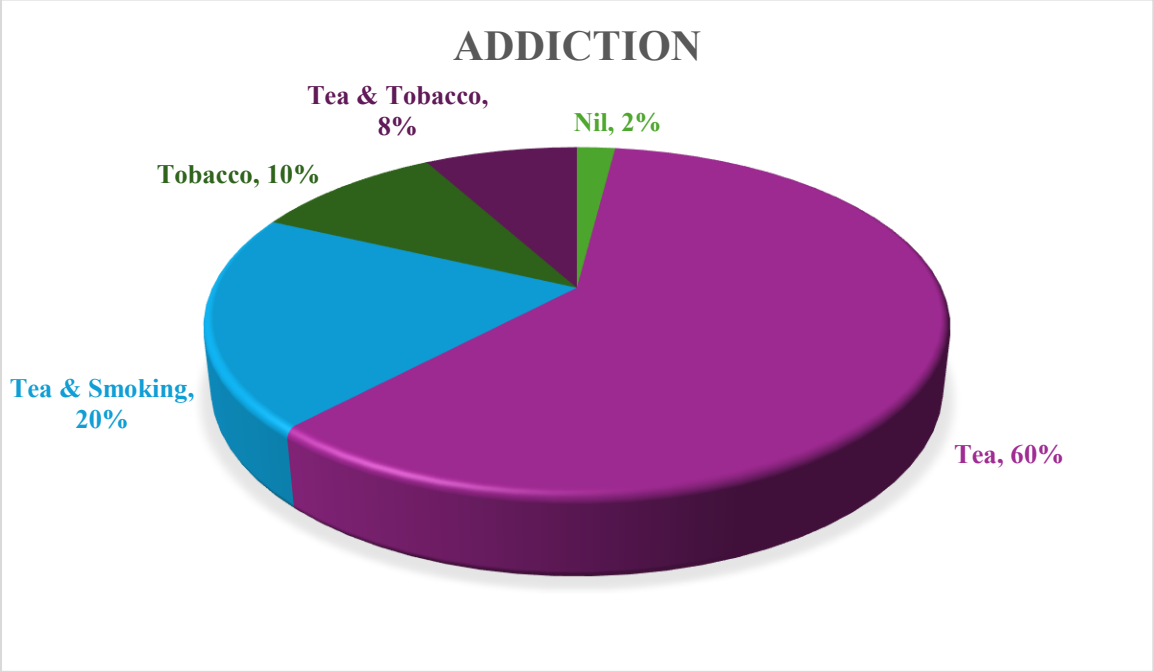


Fig. 13. Distribution of patients according to Addiction

CRITERIA FOR OVERALL ASSESSMENT OF THE THERAPY:

The obtained results were interpreted as Level of Significance-For 't' test ('p'Value)

- Nonsignificant $p>0.05$
- Significant $p\leq0.05$
- Highly significant $p\leq0.001$

14. EFFECT OF *PUNARNAVADI KWATH* ON BLOOD UREA

In Group A the mean score for **Blood Urea** showed **25% improvement**, dropping from **3.0 (BT)** to **2.24 (AT)**. This positive change was found to be **highly statistically significant (p < 0.001)**. In Group B's mean blood urea showed **15% improvement**, dropping from **3.10 (BT)** to **2.65 (AT).** This change was found to be **statistically Non-significant (p > 0.05)**

Table 17: Effect of *Punarnavadi Kwath* on blood urea

BLOOD UREA							
	Mean		SE	t value	p value	Remarks	% Improvement
	BT	AT					
Group A	3	2.24	0.087	8.718	<0.001	HS	25%
Group B	3.10	2.65	0.168	-0.238	0.814	NS	15%

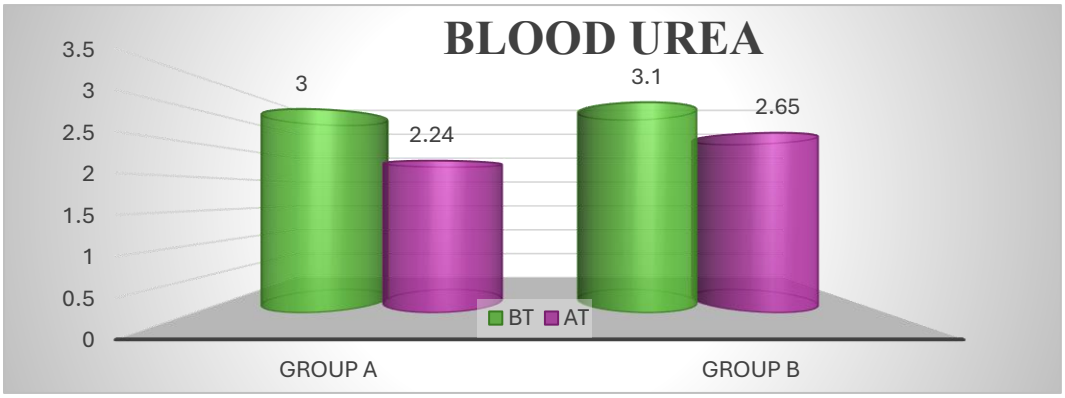


Fig. 14 -Effect Of *Punarnavadi Kwath* on Blood Urea

15. EFFECT OF *PUNARNAVADI KWATH* ON SERUM CREATININE

In Group A the mean score for **Serum Creatinine** showed **28% improvement**, dropping from **3.0 (BT)** to **2.16 (AT)**. This positive change was found to be **highly statistically significant (p < 0.001).** In Group B the mean score for **Serum Creatinine** showed **6.2% improvement**, dropping from **2.56 (BT)** to **2.40 (AT)**. This change was found to be **statistically Non-significant (p > 0.05)**

Table 18: Effect of *Punarnavadi Kwath* on serum creatinine

SERUM CREATININE							
	Mean		SE	t value	p value	Remarks	% Improvement
	BT	AT					
Group A	3	2.16	0.074	11.225	<0.001	HS	28%
Group B	2.56	2.40	0.179	0.891	0.382	NS	6.2%

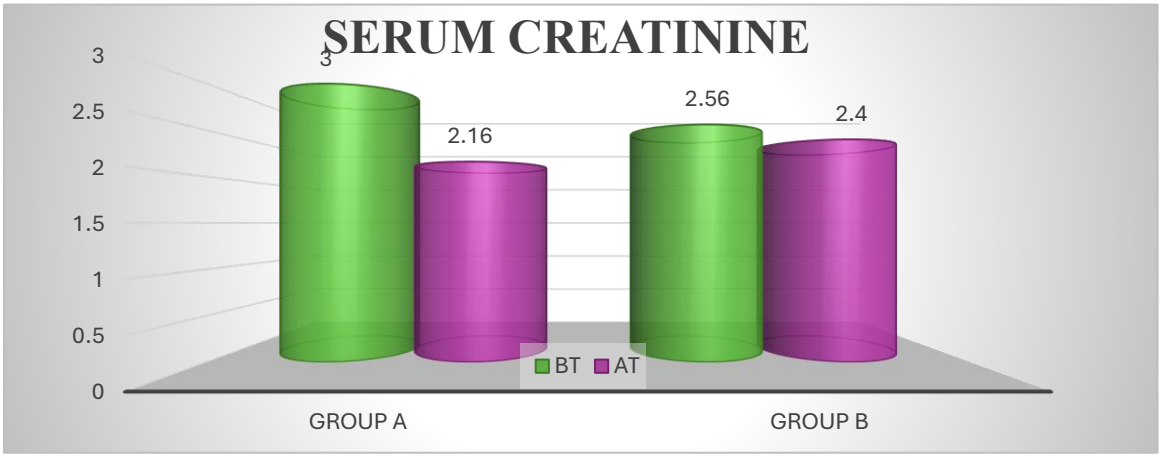


Fig. 15 -Effect Of *Punarnavadi Kwath* on Serum Creatinine

16. EFFECT OF *PUNARNAVADI KWATH* ON GFR (Glomerular Filtration Rate)

In Group A the mean score for **GFR** showed **18% improvement**, dropping from **2.84 (BT)** to **2.32(AT)**. This positive change was found to be **highly statistically significant (p < 0.001)**. In Group B's mean **GFR** showed **11% improvement**, dropping from **2.66 (BT)** to **2.36 (AT).** This change was found to be **statistically Non-significant (p > 0.05)**

GFR							
	Mean		SE	t value	p value	Remarks	% Improvement
	BT	AT					
Group A	2.84	2.32	0.101	5.099	<0.001	HS	18%
Group B	2.66	2.36	0.163	-1.225	0.233	NS	11%

Fig. 16 - Effect Of *Punarnavadi Kwath* On GFR

17. EFFECT OF *PUNARNAVADI KWATH* ON PRURITIS

In Group A the mean score for **Pruritis** showed **37% improvement**, dropping from **0.64 (BT)** to **0.04 (AT)**. This positive change was found to be **highly statistically significant (p < 0.001)**. In Group B the mean score for **Pruritis** showed 13**% improvement**, dropping from **1.80 (BT)** to **1.56 (AT)**. This change was found to be **statistically Non-significant (p > 0.05)**

PRURITIS							
	Mean		SE	t value	p value	Remarks	% Improvement
	BT	AT					
Group A	0.64	0.04	0.168	5.710	<0.001	HS	37%
Group B	1.8	1.56	0.185	1.297	0.207	NS	13%

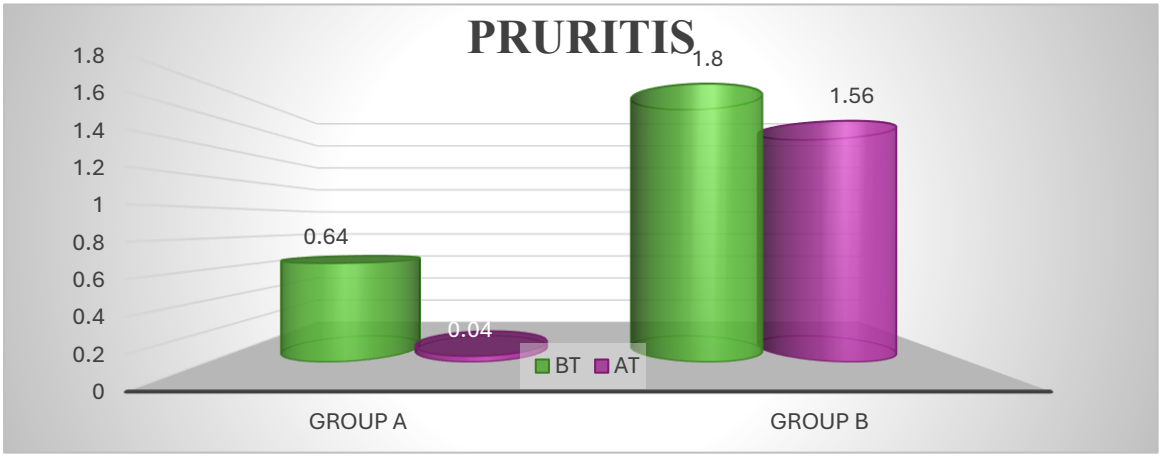


Fig.17 - Effect Of *Punarnavadi Kwath* on Pruritis

18. EFFECT OF *PUNARNAVADI KWATH* ON EDEMA

In Group A the mean score for **Edema** showed a remarkable **80% improvement**, dropping from **1.84 (BT)** to **0.36 (AT)**. This positive change was found to be **highly statistically significant (p < 0.001)**. In Group B the mean score for **Edema** showed **25% improvement**, dropping from **1.60 (BT)** to **1.20 (AT)**. This change was found to be **statistically significant (p < 0.05)**

EDEMA							
	Mean		SE	t value	p value	Remarks	% Improvement
	BT	AT					
Group A	1.84	0.36	0.101	14.513	<0.001	HS	80%
Group B	1.60	1.20	0.152	2.619	0.015	S	25%

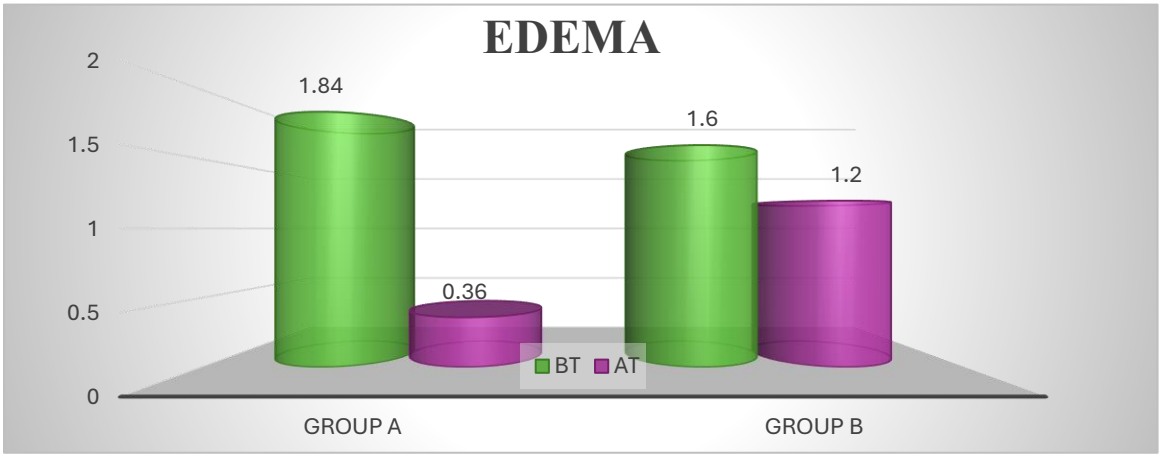


Fig. 18 –Effect of *Punarnavadi Kwath* on Edema

19. EFFECT OF *PUNARNAVADI KWATH* ON NOCTURIA

In Group A the mean score for **Nocturia** showed a remarkable **70% improvement**, dropping from **1.08 (BT)** to **0.32 (AT)**. This positive change was found to be **highly statistically significant (p < 0.001)**. In Group B the mean score for **Nocturia** showed **26% improvement**, dropping from **1.2 (BT)** to **0.88(AT)**. This change was found to be **statistically Non-significant (p > 0.05)**

NOCTURIA							
	Mean		SE	t value	p value	Remarks	% Improvement
	BT	AT					
Group A	1.08	0.32	0.166	4.575	<0.001	HS	70%
Group B	1.2	0.88	0.125	2.55	1.018	NS	26%

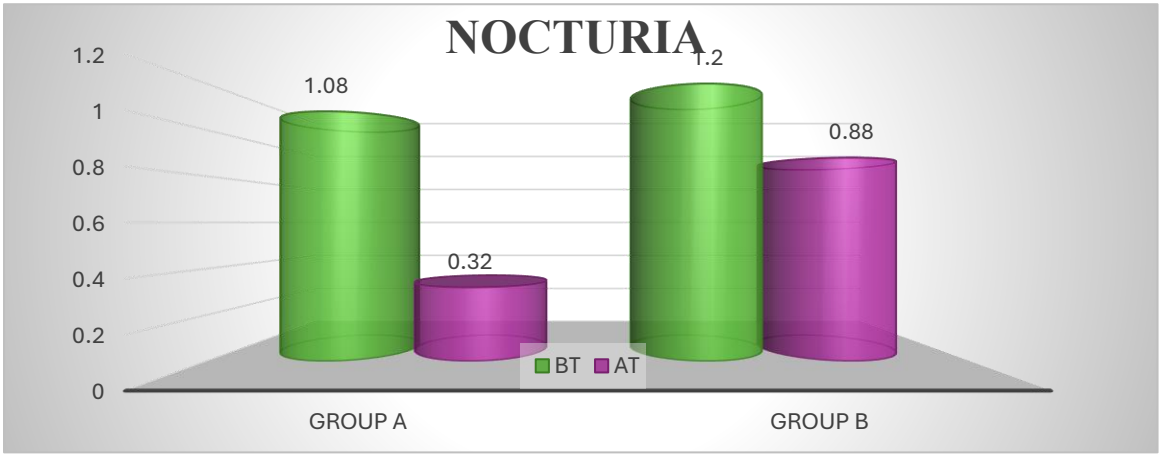


Fig. 19 –Effect of *Punarnavadi Kwath* on Nocturia

20. EFFECT OF *PUNARNAVADI KWATH* ON THIRST

In Group A the mean score for **Thirst** showed a remarkable **58% improvement**, dropping from **1.16 (BT)** to **0.48(AT)**. This positive change was found to be **highly statistically significant (p < 0.001)**. In Group B the mean score for **Thirst** showed **12% improvement**, dropping from **1.32(BT)** to **1.16 (AT)**. This change was found to be **statistically Non-significant (p > 0.05)**

THIRST							
	Mean		SE	t value	p value	Remarks	% Improvement
	BT	AT					
Group A	1.16	0.48	0.160	4.239	<0.001	HS	58%
Group B	1.32	1.16	0.170	0.941	0.356	NS	12%

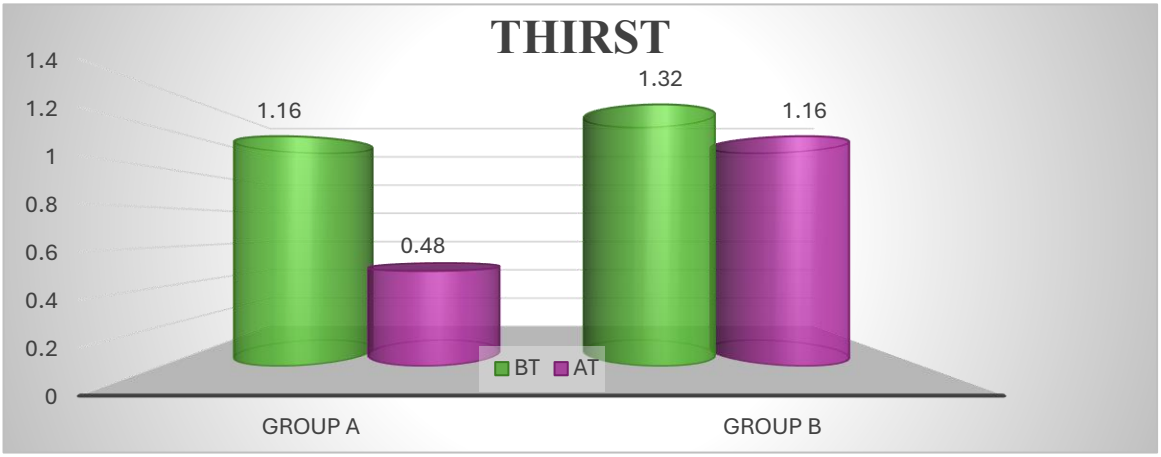


Fig. 20–Effect of *Punarnavadi Kwath* On Thirst

21. EFFECT OF *PUNARNAVADI KWATH* ON DOZING AND SLEEPINESS

	DOZING AND SLEEPINESS						
	Mean		SE	t value	p value	Remarks	% Improvement
	BT	AT					
Group A	0.6	0.44	0.188	0.848	0.405	NS	36%
Group B	1.0	0.84	0.160	1.000	0.327	NS	16%

In Group A the mean score for **Dozing or Sleepiness** showed **36% improvement**, dropping from **0.6 (BT)** to **0.44 (AT)**. This change was found to be **NON-significant (p > 0.05)**. In Group B the mean score for **Dozing or Sleepiness** showed **16% improvement**, dropping from **1.0 (BT)** to **0.84(AT)**. This change was found to be **statistically Non-significant (p > 0.05)**

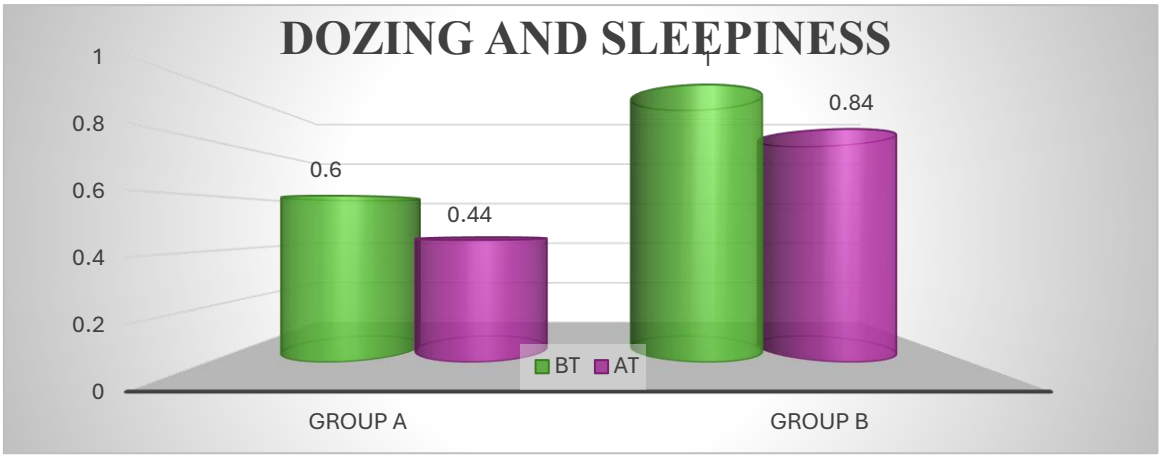


Fig. 21 –Effect Of *Punarnavadi Kwath* on Dozing Or Sleepiness

22. EFFECT OF *PUNARNAVADI KWATH* ON DYSPNEA

DYSPNEA							
	Mean		SE	t value	p value	Remarks	% Improvement
	BT	AT					
Group A	0.52	0.20	0.125	2.551	0.018	S	61%
Group B	0.8	0.68	0.120	1.000	0.327	NS	15%

In Group A the mean score for **Dyspnea** showed a remarkable **61% improvement**, dropping from **0.52 (BT)** to **0.20 (AT)**. This change was found to be **Significant (p <0.05)**. In Group B the mean score for **Dyspnea** showed **15% improvement**, dropping from **0.8(BT)** to **0.68(AT)**. This change was found to be **statistically Non-significant (p > 0.05)**

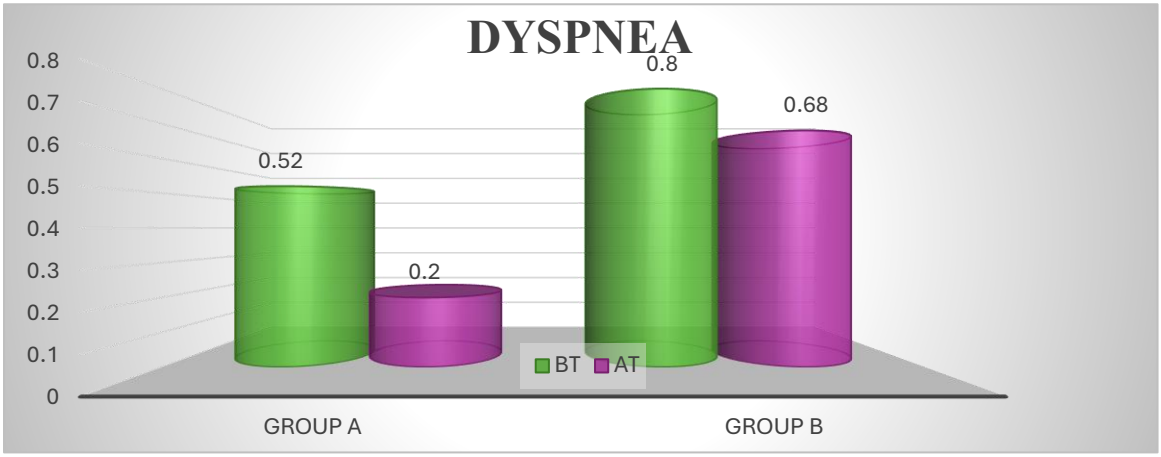


Fig. 22 –Effect of *Punarnavadi Kwath* On Dyspnea

23. EFFECT OF *PUNARNAVADI KWATH* ON MUTRAVRODHA

MUTRAVRODHA							
	Mean		SE	t value	p value	Remarks	% Improvement
	BT	AT					
Group A	1.96	1.44	0.117	4.437	<0.001	HS	26%
Group B	1.72	1.40	0.149	2.138	0.043	S	18%

In Group A the mean score for **Mutravarodha** showed **26% improvement**, dropping from **1.96(BT)** to **1.44 (AT)**. This positive change was found to be **highly significant (p < 0.001)**. In Group B the mean score for **Mutravarodha** showed **18% improvement**, dropping from **1.72 (BT)** to **1.40 (AT)**. This change was found to be **statistically significant (p < 0.05)**

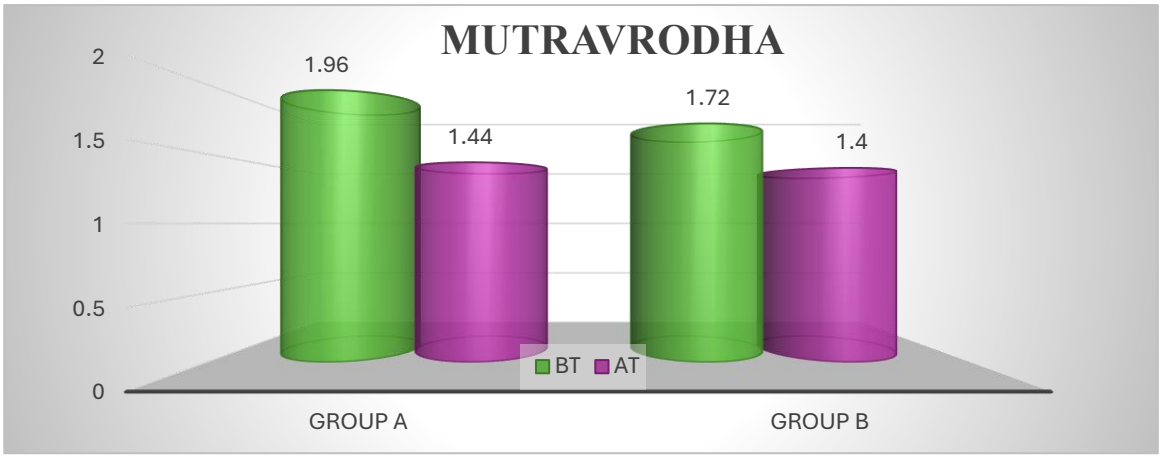


Fig. 23 –Effect Of *Punarnavadi Kwath* on Mutravarodha

24. EFFECT OF *PUNARNAVADI KWATH* ON MUTRAKRUCHA

MUTRAKRUCHA							
	Mean		SE	t value	p value	Remarks	% Improvement
	BT	AT					
Group A	1.92	1.28	0.127	5.018	<0.001	HS	33%
Group B	1.72	1.20	0.154	3.375	0.003	S	30%

In Group A the mean score for **Mutrakrucha** showed **33% improvement**, dropping from **1.92 (BT)** to **1.28 (AT)**. This positive change was found to be **highly significant (p < 0.001)**. In Group B the mean score for **Mutrakrucha** showed **30% improvement**, dropping from **1.72 (BT)** to **1.20 (AT)**. This change was found to be **statistically significant (p < 0.05)**

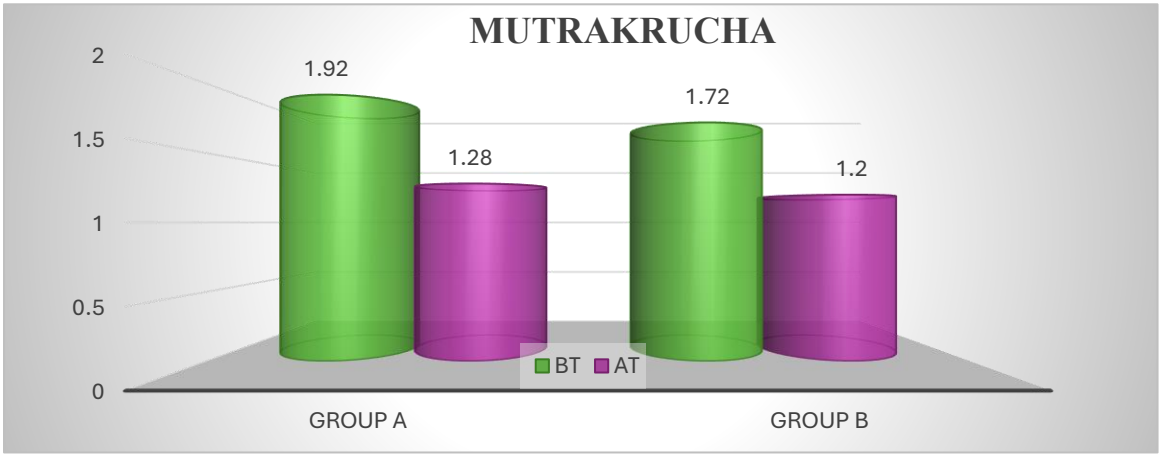


Fig. 24 –Effect Of *Punarnavadi Kwath* On Mutrakrucha

25. EFFECT OF *PUNARNAVADI KWATH* ON MUTRADAHA

In Group A the mean score for **Mutradaha** showed a remarkable **70% improvement**, dropping from **1.64 (BT)** to **0.48 (AT)**. This positive change was found to be **highly significant (p < 0.001)**. In Group B the mean score for **Mutradaha** showed **15% improvement**, dropping from **1.52 (BT)** to **1.28 (AT)**. This change was found to be **statistically Non-significant (p > 0.05)**

MUTRADAHA							
	Mean		SE	t value	p value	Remarks	% Improvement
	BT	AT					
Group A	1.64	0.48	0.160	7.250	<0.001	HS	70%
Group B	1.52	1.28	0.175	1.365	0.185	NS	15%

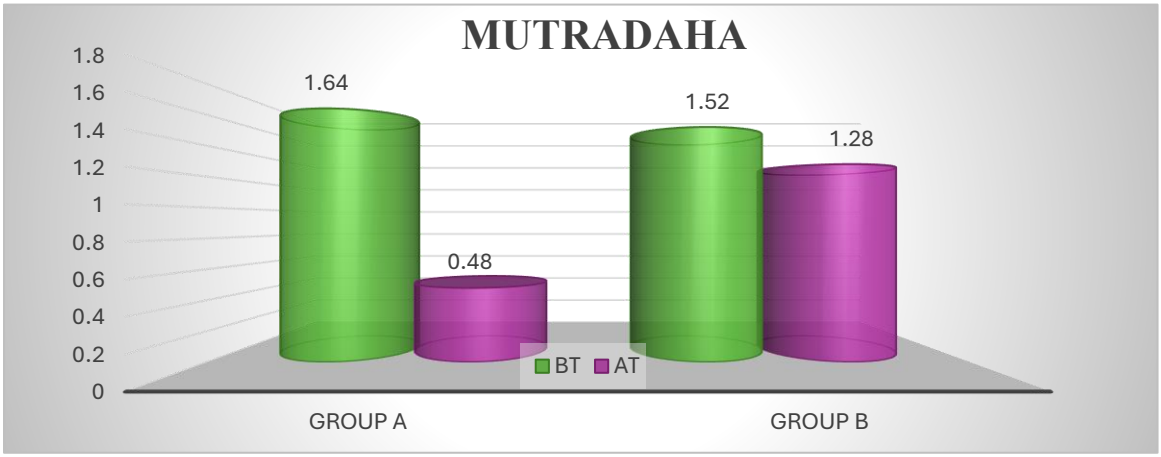


Fig. 25 –Effect Of *Punarnavadi Kwath* on Mutradaha

26. EFFECT OF *PUNARNAVADI KWATH* ON ANOREXIA

In Group A the mean score for **Anorexia** showed a remarkable **90% improvement**, dropping from **0.44 (BT)** to **0.04(AT)**. This change was found to be **statistically significant (p < 0.05)**. In Group B the mean score for **Anorexia** showed **50% improvement**, dropping from **0.76 (BT)** to **0.38 (AT).** This change was found to be **statistically Non-significant (p > 0.05)**

ANOREXIA							
	Mean		SE	t value	p value	Remarks	% Improvement
	BT	AT					
Group A	0.44	0.04	0.115	3.464	0.002	S	90%
Group B	0.76	0.38	0.157	-0.253	0.802	NS	50%

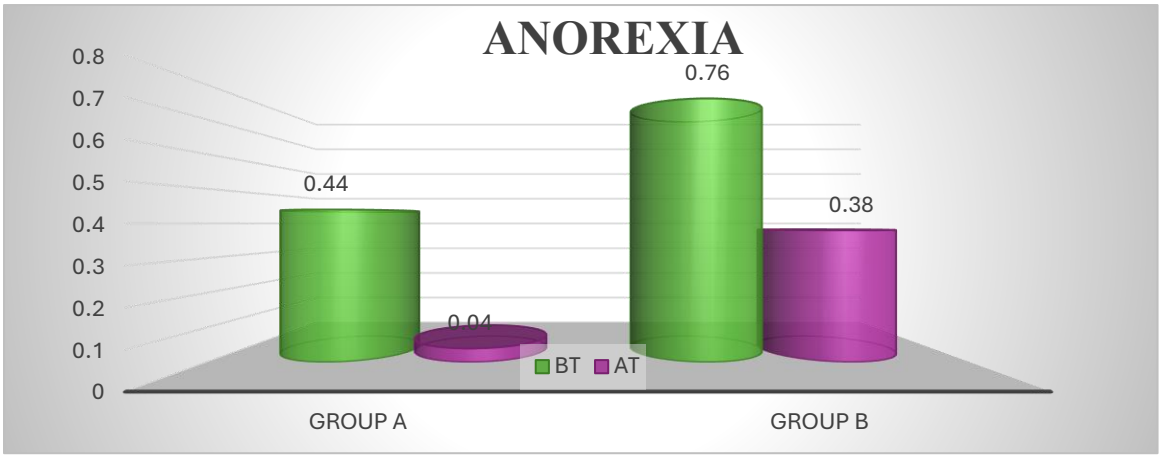


Fig. 26–Effect Of *Punarnavadi Kwath* on Anorexia

27. EFFECT OF *PUNARNAVADI KWATH* ON VOMITING

In Group A the mean score for **Vomiting** showed a remarkable **100% improvement**, dropping from **0.28 (BT)** to **0.00 (AT)**. This positive change was found to be **statistically significant (p < 0.05)**. In Group B the mean score for **Vomiting** showed **8% improvement**, dropping from **0.48 (BT)** to **0.44 (AT)**. This change was found to be **statistically Non-significant (p > 0.05)**

VOMITING							
	Mean		SE	t value	p value	Remarks	% Improvement
	BT	AT					
Group A	0.28	0.00	0.091	3.055	0.005	S	100%
Group B	0.48	0.44	0.122	0.327	0.746	NS	8%

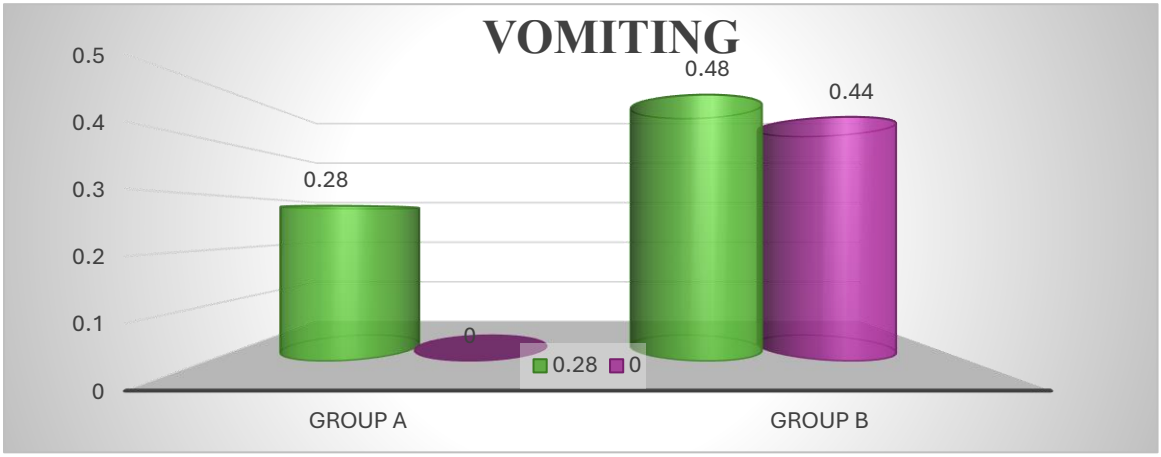


Fig. 27 –Effect Of *Punarnavadi Kwath* On Vomiting

28. EFFECT OF *PUNARNAVADI KWATH* ON ANAEMIA

ANAEMIA							
	Mean		SE	t value	p value	Remarks	% Improvement
	BT	AT					
Group A	1.92	2.00	0.080	-1	0.327	NS	4%
Group B	1.76	1.56	0.152	-1.309	0.203	NS	11%

In Group A the mean score for **Anemia** showed **4% improvement**, dropping from **1.92 (BT)** to **2.00 (AT)**. This change was found to be **NON- significant (p > 0.05)**. In Group B the mean score for **Anemia** showed **8% improvement**, dropping from **1.76 (BT)** to **1.56 (AT).** This change was found to be **statistically Non-significant (p > 0.05)**

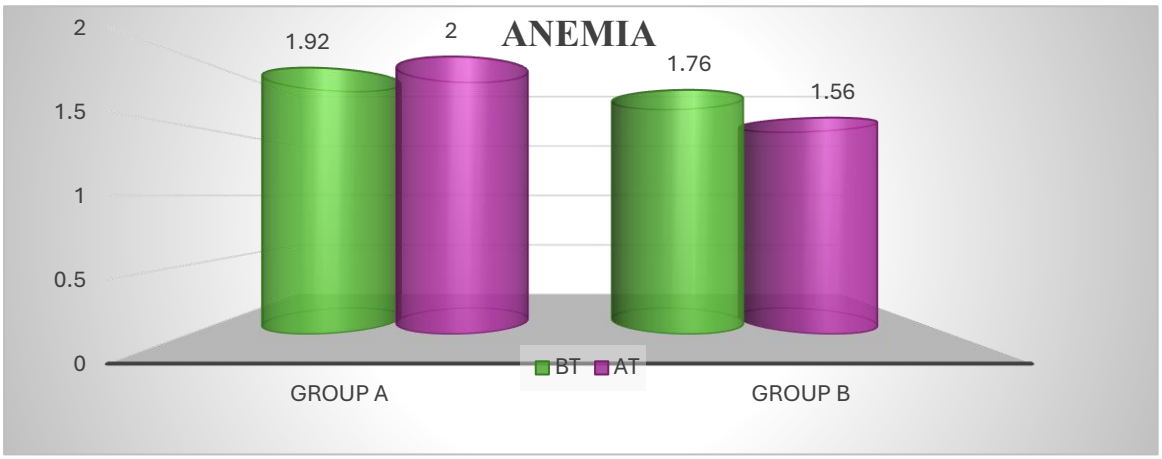


Fig. 28 –Effect Of *Punarnavadi Kwath* on Anemia

29. EFFECT OF *PUNARNAVADI KWATH* ON MUTRALAPATA

MUTRALAPATA							
	Mean		SE	t value	p value	Remarks	% Improvement
	BT	AT					
Group A	2.12	1.40	0.108	6.647	<0.001	HS	33%
Group B	1.8	1.6	0.152	1.309	0.203	NS	11%

In Group A the mean score for **Mutralpata** showed **33% improvement**, dropping from **2.12(BT)** to **1.40 (AT)**. This positive change was found to be **highly statistically significant (p < 0.001)**. In Group B the mean score for **Mutralpata** showed **11% improvement**, dropping from **1.8 (BT)** to **1.6 (AT)**. This change was found to be **statistically Non-significant (p > 0.05)**

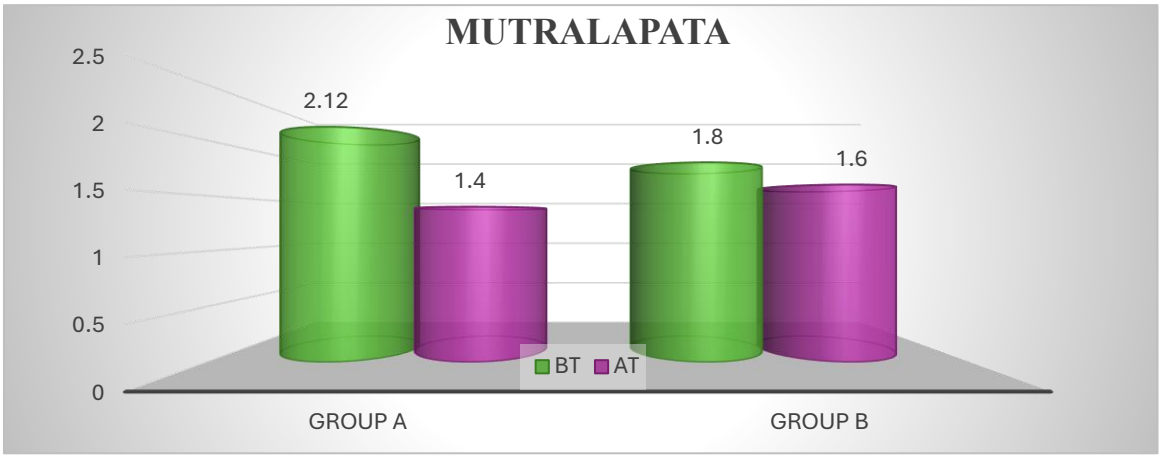


Fig. 29 –Effect Of *Punarnavadi Kwath* on Mutralpata

Table 33: Prevalence of Reported Symptoms and Parameters in CKD Patients

Prevalence of Reported Symptoms and Parameters in CKD Patients				
EVALUATION CRITERIA	TOTAL NO. OF PATIENTS		PERCENTAGE	
	Group A	Group B	Group A	Group B
BLOOD UREA	25	25	100%	100%
SERUM CREATININE	25	25	100%	100%
GFR	25	25	100%	100%
PRURITIS	20	21	80%	42%
EDEMA	25	25	100%	100%
NOCTURIA	17	19	68%	38%
THIRST	18	19	72%	38%
DOZING OR SLEEPINESS	10	15	40%	30%
DYSPNEA	10	16	40%	32%
MUTRAVRRODHA	25	25	100%	100%
MUTRAKRUCHA	25	25	100%	100%
MUTRADAHA	23	23	92%	26%
ANOREXIA	11	14	44%	28%
VOMITING	7	12	28%	24%
ANEMIA	24	24	96%	48%
MUTRALPATA	25	25	100%	100%

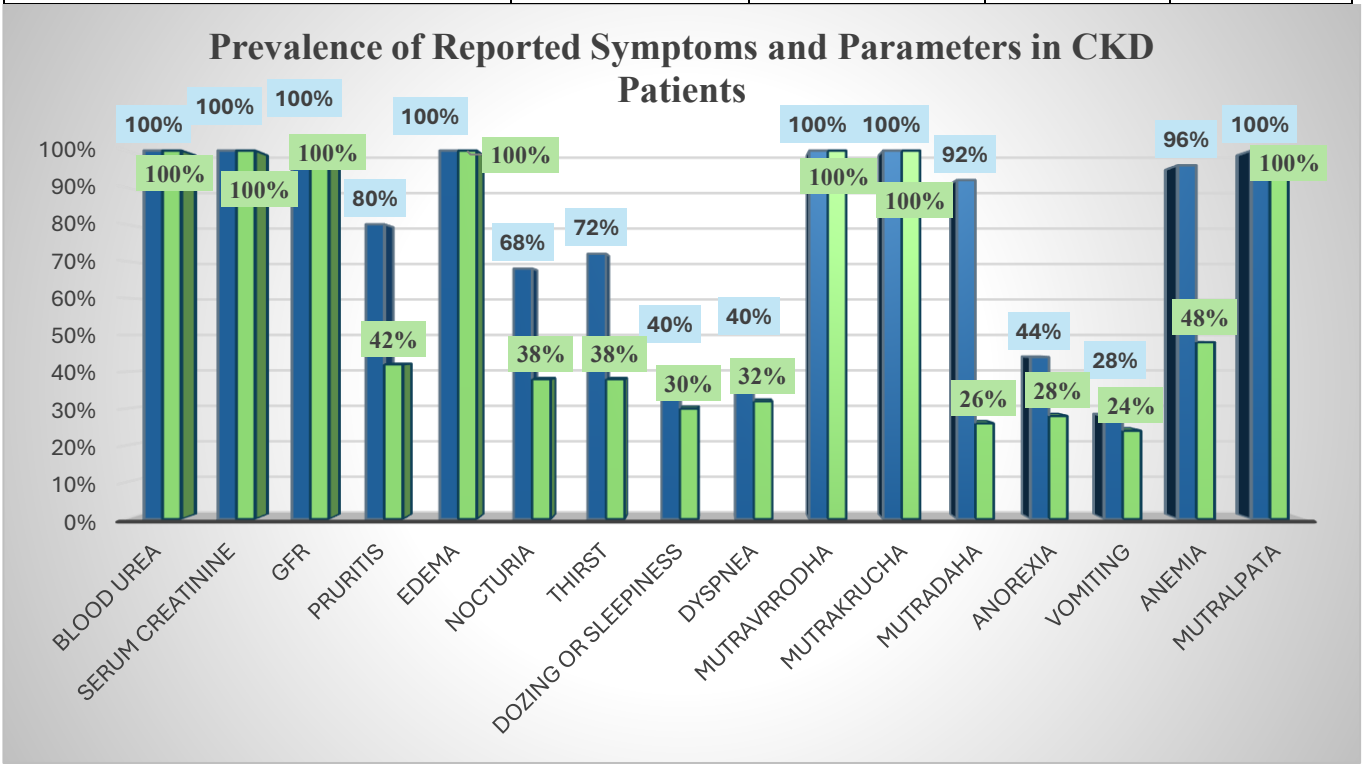
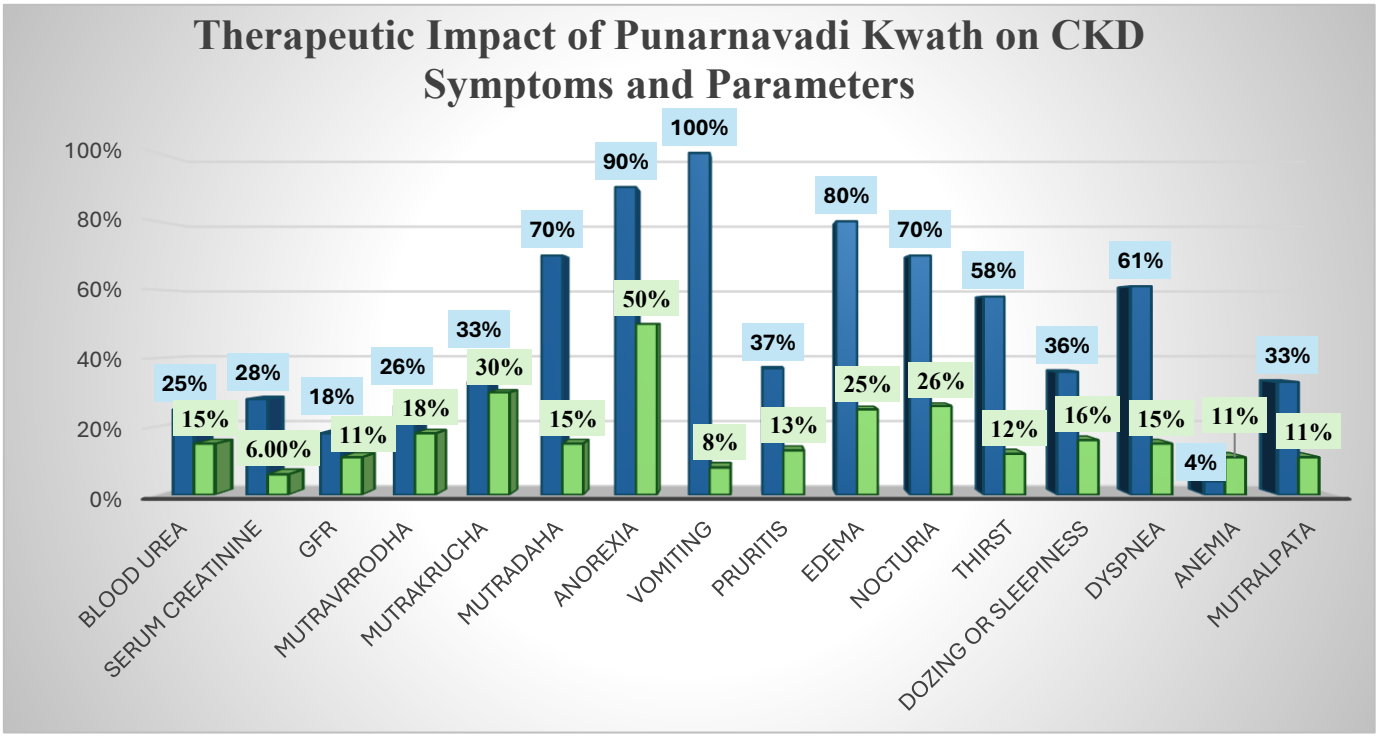


Table 34: Therapeutic Impact of *Punarnavadi Kwath* on CKD Symptoms and Parameters

Therapeutic Impact of *Punarnavadi Kwath* on CKD Symptoms and Parameters		
EVALUATION CRITERIA	**PERCENTAGE**	
	Group A	**Group B**
BLOOD UREA	25%	15%
SERUM CREATININE	28%	6.2%
GFR	18%	11%
MUTRAVRRODHA	26%	18%
MUTRAKRUCHA	33%	30%
MUTRADAHA	70%	15%
ANOREXIA	90%	50%
VOMITING	100%	8%
PRURITIS	37%	13%
EDEMA	80%	25%
NOCTURIA	70%	26%
THIRST	58%	12%
DOZING OR SLEEPINESS	36%	16%
DYSPNEA	61%	15%
ANEMIA	4%	11%
MUTRALPATA	33%	11%



DISCUSSION:

The facts which have emerged from the study can be studied in 3 main headings.

1. Discussion on Observations

2. Discussion on Results

3. Discussion on Trial Drugs *Punarnavadi Kwath.*

DISCUSSION ON OBSERVATIONS:

A total of 50 patients were recruited for this study, divided equally into two groups: Group A (25 patients) and Group B (25 patients). Participants were enrolled irrespective of their religion or occupation, after rigorously applying predefined inclusion and exclusion criteria.

Age:

The study found the highest incidence of Chronic Kidney Disease (CKD) in the 51-70 years age group (46%), with the lowest incidence in the 18-30 years age group (12%). This suggests that older individuals are more susceptible to CKD, likely due to the natural degenerative processes associated with aging and the Ayurvedic concept of *Vata Dosha* predominance in later life.

Gender

In the present study, an observed gender distribution among the 50 enrolled Chronic Kidney Disease (CKD) patients revealed a male predominance, with 64% (n=32) being male and 36% (n=18) female. While CKD is more prevalent in women than men, potentially due to factors like longer life expectancy and the use of estimated glomerular filtration rate (eGFR) equations, which may over diagnose CKD in women. men tend to progress to end-stage kidney failure (ESKD) and require kidney replacement therapy more frequently. The reasons for these differences are not fully understood, but may involve factors like sex hormones, lifestyle, and access to care.

Status of Education

The number of individuals and their corresponding percentages are as follows: illiterate 12 (24%), primary school 3 (6%), secondary school 3 (6%), higher secondary school 7 (14%), senior secondary school 5 (10%), graduate 18 (36%), and post-graduate 2 (4%). The presence of a notable percentage of illiterate individuals suggests potential disparities. This distribution prompts consideration of how educational status might intersect with CKD development and management. Lower educational attainment often correlates with reduced health literacy and limited access to healthcare, which could contribute to delayed diagnosis, less effective management of predisposing conditions (like hypertension or diabetes), and poorer adherence to treatment regimens in these subgroups. Conversely, the significant representation of graduates might reflect broader demographic trends within the sampled population or indicate that CKD susceptibility is not solely confined to socio-economically disadvantaged groups, potentially influenced by lifestyle or genetic factors even among highly educated individuals. Further research exploring the specific links between educational background, health literacy, socioeconomic status, and CKD outcomes within this population would be valuable to elucidate these observed patterns.

Socioeconomic Status

The majority of the study participants, specifically 26 individuals (52%), were from the below poverty line group, while 24 participants (48%) belonged to the above poverty line group. High socioeconomic status (SES) is significantly associated with a higher risk of developing and progressing through Chronic Kidney Disease (CKD). This association is driven by several factors, including increased exposure to risk factors like obesity, hypertension, and diabetes. However, no definitive conclusion can be made based solely on this observation

Status of *Agni*:

The study found that 19 (38%) of patients had a history of *Tikshana Agni*, 24 (48%) of patients had a history of *Samaagni*, and 7 (14%) of patients had a history of *Mandaagni* suggests The observation of a high incidence of *Tikshna Agni* alongside *Samaagni* in CKD patients, rather than a clear dominance of *Mandaagni*, highlights the complex and multi-faceted Ayurvedic pathogenesis of CKD. It suggests that while *Mandaagni* leading to *Ama* accumulation is a classic pathway, *Tikshna Agni* leading to excessive tissue catabolism and subsequent *Vata* aggravation, or even subtle, localized *Dhatwagni Mandya* despite *Sama Jatharagni*, can also contribute significantly to the disease. The invariable presence of *Kapha* and *Vata provocation* mentioned is indeed a core aspect, with *Vata* driving degeneration and *Kapha* contributing to fluid imbalances and obstruction, often as a result of *Agni* dysregulation at various levels. Further studies could explore the correlation between specific *Agni* types and the stage or specific manifestations of CKD.

Status of *Koshtha*:

Koshtha refers to bowel habits that are influenced by *Prakriti* (constitution). Constitution signifies the nature of bowel habits from birth. In the study, 40 subjects (80%) were identified with *Madhyama Koshtha*, 7 subjects (14%) with *Mridu Koshtha*, and 3 subject (6%) with *Krura Koshtha.* The predominance of *Madhyama Koshtha* suggests that while overall bowel habits might appear stable in most CKD patients, individualized assessment remains crucial. For patients with *Mridu* or *Krura Koshtha*, tailored Ayurvedic interventions aimed at balancing *Pitta* or *Vata* respectively, and ensuring proper elimination, become even more critical for holistic CKD management. Ensuring optimal bowel function is vital in CKD, as it facilitates the elimination of metabolic waste products, thereby reducing the burden on the compromised kidneys and preventing further *Ama* accumulation and *Srotorodha*. This underscores the importance of *Koshtha Pariksha* in personalizing dietary and therapeutic approaches in CKD.

Dietary habit:

The majority of the study participants, 28 individuals (56%), were vegetarian, while 22 participants (44%) followed either a non-vegetarian or mixed diet. No conclusion can be made with this observation because this study was performed in the region where majority of the population is vegetarian.

DISCUSSION ON RESULTS:

Effect of ayurvedic management on Laboratory investigation:

- Poor kidney function leads to a buildup of creatinine in the blood because the kidneys can't filter it out efficiently. As a result, this excess creatinine isn't excreted in the urine, causing the serum creatinine level to increase.
- A consistent decline in eGFR was observed across all patients, attributable to the accumulation of serum creatinine, which is directly linked to eGFR calculation.
- *Punarnavadi Kwath* primarily possesses *laghu* (light), *rūkṣa* (dry), and *snigdha* (unctuous/oily) qualities. These properties aid in mitigating *Kapha*, thereby removing the obstruction (*Avaraṇa*) caused by *Kapha* and ultimately promoting the normal function of *vata*.
- The kidneys excrete nitrogenous waste, primarily urea, through urine-a vital evolutionary adaptation. When the kidneys are hypo functioning, their inability to clear these wastes leads to an *increased* concentration of urea in the blood.
- In total *Punarnavadi* compound is predominantly packed with *Pitta Shamaka Rasa*, *Tri-Doshahara Guna*, *Tri-Doshahara Veerya*, *Pitta Shamaka Vipaka*. This combination makes it a potent *Tridoshahara* mainly targeting *Pitta Dosha*. On the other hand, Chronic Kidney Disease has *Pitta* dominant *Tridosha* in its pathology, hence probably it can be postulated that *Punarnavadi* compound shows its action by controlling *Pitta* and *Vata* followed by rest of the *Dosha* avoiding them from further aggravation thus slowing the pace of disease. *Tikta Rasa* present in *Punarnavadi* compound brings *Niraamata* and increases *Jatharagni*, another useful function recommended in renal failure wherein Agni Mandya is invariably present. *Tikta Rasa* and *Rooksha Guna* help in drying of Ama, bring out a clear *Rasa Dhatu* and clear the Srotus, further helping in good circulation making way for proper *Dhatu* nourishment. *Tikta Rasa* is chosen in the *Vyadhis* involving *Rakta Dhatu* here in renal failure *Rakta* is the earliest *Dhatu* to be affected.[45]

Effect of Ayurvedic management on symptoms:

- The oedema associated with kidney disease usually occurs in legs and around eyes. Damage to the tiny, filtering blood vessels, the heavy loss of protein in the urine, in kidneys can result in nephrotic syndrome. In nephrotic syndrome, declining levels of protein (albumin) in blood can lead to fluid accumulation and oedema.
- According to Ayurveda, these symptoms are caused by provoked *Kapha*. In Group A the mean score for Edema showed a remarkable **80% improvement**, dropping from **1.84 (BT)** to **0.36 (AT)**. This positive change was found to be **highly statistically significant ($p < 0.001$)**. In Group B the mean score for Edema showed **25% improvement**, dropping from **1.60 (BT)** to **1.20 (AT)**. This change was found to be **statistically significant ($p < 0.05$).** This suggests that ***Punarnavadi Kwath***, with its *Mootral* and *Shothahara* properties, provides substantial additional benefit in managing CKD-related fluid retention by addressing underlying *Dosha* imbalances beyond what conventional hemodialysis alone (Group B) achieves.
- The severity of *Pruritis* was markedly decreased and the results were statistically highly significant ($P<0.001$). This means, Ayurvedic treatment is very effective in reducing the severity of *Pruritis* in patients of Chronic Kidney Disease. As observed, In Group A the mean score for **Pruritis** showed **37% improvement**, dropping from **0.64 (BT)** to **0.04 (AT)**. This positive change was found to be **highly statistically significant ($p < 0.001$)**. In Group B the

mean score for **Pruritis** showed 13**% improvement**, dropping from **1.80 (BT)** to **1.56 (AT)**. This change was found to be **statistically Non-significant (p > 0.05).** Effect of ayurvedic treatment in the body and there by pacifies the *Pitta and Kapha doṣa*, thus subsidence of the *Pruritis* in patients of CKD.

- **Effect of Ayurvedic Management on Anorexia**

  The study's findings on anorexia (loss of appetite), a common and debilitating symptom in CKD, reveal a clear difference in the efficacy of the two treatment approaches.

  In Group A (Punarnavadi Kwath + Hemodialysis)**,** there was a remarkable 90% improvement in anorexia, with the mean score dropping significantly from 0.44 at baseline (BT) to 0.04 after treatment (AT). This profound change was statistically significant ($p < 0.05$)**,** indicating that the addition of *Punarnavadi Kwath* played a crucial role in restoring appetite. From an Ayurvedic perspective, anorexia (*Aruchi* or *Anannabhilasha*) is primarily associated with the vitiation of *Kapha* and *Vata Doshas*, and crucially, the weakening of *Jatharagni* (digestive fire). *Punarnavadi Kwath*, with its *Deepana* (appetizer) and *Pachana* (digestive) properties, directly addresses these imbalances. It is known to stimulate *Agni*, clear *Srotorodha* (channel obstruction) caused by *Ama* (toxins), and balance *Kapha* and *Vata*, thereby enhancing the desire for food and improving digestion. The highly significant improvement in Group A suggests that *Punarnavadi Kwath* effectively targets the root causes of anorexia in CKD patients.

  Conversely, Group B (Standard Care Only) showed a 50% improvement in anorexia, with the mean score decreasing from 0.76 (BT) to 0.38 (AT). However, this improvement was not statistically significant ($p > 0.05$)**.** While hemodialysis can alleviate some systemic symptoms by removing toxins, it does not directly act as an appetite stimulant or specifically address the *Agni* and *Dosha* imbalances that lead to anorexia in the same way Ayurvedic formulations do. The non-significant improvement in Group B indicates that conventional therapy alone may offer only partial or inconsistent relief for anorexia in CKD patients.

- In Group A the mean score for **Vomiting** showed a remarkable **100% improvement**, dropping from **0.28 (BT)** to **0.00 (AT)**. This positive change was found to be **statistically significant (p < 0.05)**. In Group B the mean score for **Vomiting** showed **8% improvement**, dropping from **0.48 (BT)** to **0.44 (AT)**. This change was found to be **statistically Non-significant (p > 0.05).** Data shows that, patients had reduction in severity of vomiting. This affirms that Ayurvedic treatment is effective in reducing the severity of vomiting.

- In Group A the mean score for **Dyspnea** showed a remarkable **61% improvement**, dropping from **0.52 (BT)** to **0.20 (AT)**. This change was found to be S**ignificant (p <0.05)**. In Group B the mean score for **Dyspnea** showed **15% improvement**, dropping from **0.8(BT)** to **0.68(AT)**. This change was found to be **statistically Non-significant (p > 0.05).** Breathlessness in Chronic Kidney Disease patients is commonly attributed to fluid overload leading to pulmonary edema. From an Ayurvedic perspective, *Punarnavadi Kwath* eases breathlessness by relieving *Kapha* provocation. *Kapha dosha* is associated with fluid retention, congestion, and respiratory discomfort, and its pacification by the Ayurvedic treatment aligns with the observed symptomatic relief.

DISCUSSION ON PROBABLE MODE OF ACTION AND EFFICACY OF *PUNARNAVADI KWATH*, IN CHRONIC KIDNEY DISEASE (CKD):

Among the various Ayurvedic formulations, *Punarnavadi Kwath* stands out as a significant polyherbal decoction traditionally used for conditions involving fluid retention and renal dysfunction. Its probable efficacy in CKD is attributed to the synergistic action of its eight main ingredients, with *Punarnava* (*Boerhavia diffusa*) being a principal component. Research on *Punarnava* highlights its well-documented diuretic, anti-inflammatory, antioxidant, and nephroprotective properties. The diuretic effect helps combat edema and fluid overload common in CKD by promoting the excretion of excess water and toxins, thereby reducing the burden on compromised kidneys. Its anti-inflammatory and antioxidant activities are crucial in mitigating the oxidative stress and chronic inflammation that are central to the pathogenesis and progression of kidney damage. *Punarnava* may also help in preserving the structural integrity and function of nephrons and potentially aid in cellular regeneration by clearing microcirculatory blockages, aligning with the Ayurvedic concept of removing *Srotosanga* (channel obstruction).

Other key ingredients in *Punarnavadi Kwath*, such as *Haritaki* (Terminalia chebula), *Nimba* (Azadirachta indica), *Daruharidra* (Berberis aristata), *Katuki* (Picrorhiza kurroa), *Patola* (Trichosanthes dioica), *Guduchi* (Tinospora cordifolia), and *Shunthi* (Zingiber officinale), collectively contribute to its therapeutic profile. These herbs offer additional benefits including anti-inflammatory, hepatoprotective, digestive, and detoxifying properties. For instance, *Guduchi* is renowned for its immunomodulatory and adaptogenic effects, supporting overall systemic health, while *Katuki* and *Nimba* contribute to detoxification and anti-inflammatory actions. The combined effect of these ingredients is reducing elevated serum creatinine and blood urea levels, improve estimated glomerular filtration rate (eGFR), and alleviate associated CKD symptoms like generalized swelling (*Shotha*), fatigue, and decreased appetite.

Clinical observations and studies have indicated that *Punarnavadi Kwath* can lead to improvements in objective markers of kidney function and a better quality of life for CKD patients, potentially delaying the need for renal replacement therapies. From an Ayurvedic standpoint, its action involves pacifying aggravated *Kapha* (reducing congestion and fluid accumulation) and balancing *Vata* (supporting tissue integrity and normal physiological functions), thereby addressing the root cause of the pathology. While the traditional wisdom and preliminary clinical evidence are promising, further rigorous, large-scale randomized controlled trials are essential to scientifically validate the full spectrum of *Punarnavadi Kwath*'s efficacy, establish optimal dosages, and ascertain its long-term safety in the management of CKD.

Summary:

This observational study investigates the therapeutic potential of *Punarnavadi Kwath*, a classical Ayurvedic formulation, as part of *Shamana Chikitsa* in the management of Chronic Kidney Disease (CKD) among patients undergoing haemodialysis. The study evaluates the adjunctive use of *Punarnavadi Kwath* alongside conventional dialysis protocols to assess its efficacy in mitigating clinical symptoms associated with CKD. Preliminary findings suggest that the integration of this Ayurvedic intervention may contribute to symptomatic relief, improved fluid balance, and enhanced quality of life. These outcomes indicate the potential value of incorporating traditional Ayurvedic therapies into the multidisciplinary management of CKD.

Conclusion:

This study underscores the potential therapeutic benefits of integrating *Punarnavadi Kwath*—an Ayurvedic polyherbal formulation—into the management regimen of Chronic Kidney Disease (CKD) patients undergoing haemodialysis. The formulation's diuretic, anti-inflammatory, and nephroprotective properties, attributed to its constituent herbs such as *Boerhavia diffusa* (*Punarnava*), *Katuki*, *Haritaki, Daruharidra* have been documented to alleviate symptoms associated with CKD, including fluid retention and oxidative stress.[45]

Clinical studies have demonstrated that the adjunctive use of *Punarnavadi Kwath*, especially when administered alongside therapies like *Niruha Basti*, can lead to significant improvements in renal function parameters.[46] Notably, reductions in serum creatinine and blood urea levels have been observed, suggesting enhanced renal clearance and overall kidney function.

Furthermore, the integration of Ayurvedic interventions such as *Punarnavadi Kwath* aligns with the growing global interest in complementary and alternative medicine for CKD management. A significant proportion of CKD patients report the use of Ayurvedic treatments, indicating a preference for holistic approaches that address the multifaceted nature of the disease.[47]

In conclusion, the incorporation of *Punarnavadi Kwath* into the treatment protocol for CKD patients undergoing haemodialysis offers a promising adjunctive therapy. While preliminary findings are encouraging, further rigorous clinical trials are essential to validate these results and Future research should aim to develop evidence-based integrative treatment models that seamlessly combine Ayurvedic and conventional medical approaches. Such models have the potential to enhance the management of Chronic Kidney Disease (CKD) by offering more comprehensive, holistic, and patient-centered care. Integrating traditional and modern systems of medicine could pave the way for improved therapeutic outcomes and a more sustainable approach to CKD treatment.

LIMITATIONS OF THE PRESENT STUDY:

- The sample size was small to generalize the result.
- Short Study Duration (6 weeks)

FUTURE SCOPE FOR THE FURTHER STUDY:

- Long standing administration of the therapy with prolonged follow-up may elaborate the result more specifically.
- This study can be a direction for long standing prospective analytical cohort study or for randomized, standard control study containing large sample.

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