ORIGINAL ARTICLE

A Comparative Clinical Evaluation of Patolapatra-Chitrak Kwath and Vidangadi Churna in the Management of Sthaulya (Obesity): A Prospective Randomised Open-Label Trial

Akanksha Dubey[1], Hemant Paradkar[2], Anaya Pathrikar[3], Ashwini Sutar[4]

[1]Post Graduate Scholar, [2]Associate Professor, [3]Professor and HOD, [4]Post Graduate Scholar

Department of Kayachikitsa, APM's Ayurved Mahavidyalaya & Seth R.V. Ayurvedic Hospital, Sion, Mumbai, Maharashtra, India

Corresponding author:
Dubey Akanksha
Department of Kayachikitsa, APM's Ayurved Mahavidyalaya & Seth R.V. Ayurvedic Hospital, Sion, Mumbai, Maharashtra, India
Email: akanshadubey93@gmail.com

Received: 05.01.2026
Accepted: 25.01.2026

How to cite this article:
Dubey A, Paradkar H, Pathrikar A, Sutar A. A Comparative Clinical Evaluation of Patolapatra-Chitrak Kwath and Vidangadi Churna in the Management of Sthaulya (Obesity): A Prospective Randomised Open-Label Trial. Int J Adv Integ Med Sci 2026;11(1):11-17.
Source of Support: Nil,
Conflicts of Interest: None declared.

ABSTRACT

Background: Sthaulya (obesity) is a growing public health challenge driven by impaired fat tissue metabolism (Medodhatvagnimandya) and channel obstruction (Srotorodha), which Ayurvedic formulations holistically treat by addressing these underlying root causes.

Objective: To compare the efficacy and safety of Patolapatra-Chitrak Kwath and Vidangadi Churna in the clinical management of Sthaulya (BMI 25–30 kg/m²).

Methods: An IEC-approved, randomised comparative trial evaluated sixty patients (aged 20–60 years) across two groups of 30. Group A received Patolapatra-Chitrak Kwath (48 mL twice daily) and Group B received Vidangadi Churna (3 g twice daily) for 60 days. The primary endpoint was BMI change from baseline to day 60. Intragroup analysis used Paired t-test and Wilcoxon Signed-Rank Test; intergroup comparison used independent t-test.

Results: Both groups demonstrated statistically significant intragroup improvements in all objective parameters ($p < 0.001$). Mean BMI reduction was 1.04 kg/m² (3.57%) in Group A and 1.09 kg/m² (3.78%) in Group B. No significant intergroup differences were observed ($p > 0.05$). Group B showed superior subjective relief for Atitrishna (91.89%), Angamarda (87.71%), and Aalasya (100%); Group A excelled in Shwaskashtata (60.00%) and Sharir Dourgandhya (60.00%). Overall success was 56.7% for both. Group A had two managed Grade 1 adverse events; Group B had none.

Conclusion: Both formulations are clinically effective Ayurvedic interventions for Sthaulya. Vidangadi Churna demonstrated marginally superior subjective benefit and a favourable safety profile. Rigorous Pitta screening is required before prescribing Patolapatra-Chitrak Kwath.

KEYWORDS: Sthaulya; obesity; Patolapatra-Chitrak Kwath; Vidangadi Churna; BMI; randomised clinical trial

INTRODUCTION

The World Health Organization classifies obesity as a chronic, relapsing non-communicable disease. By 2022, approximately 43% of adults worldwide were overweight, and 16% were living with obesity.[1] Projections suggest that by 2050, nearly 3.8 billion individuals worldwide will be overweight or obese, with India contributing approximately 450 million cases.[2] India currently has an estimated 180 million adults living with excess weight,[3] with urban populations disproportionately affected due to sedentary lifestyles and dietary transitions.

Excess adiposity is strongly associated with type 2 diabetes mellitus, hypertension, dyslipidaemia, coronary artery disease, non-alcoholic fatty liver disease, polycystic ovarian syndrome, obstructive sleep apnoea, and several malignancies.[4] Shared pathophysiological mechanisms — primarily insulin resistance and chronic low-grade inflammation — substantially elevate cardiovascular morbidity and mortality.[5] Despite available pharmacological and surgical interventions, long-term recurrence rates remain high and adverse effects limit widespread application.

Within the classical Ayurvedic corpus, obesity is described as Sthaulya or Medoroga, categorised under Ashtauninditiya Purusha — the eight undesirable constitutional states.[6] Acharya Charaka classified Atisthaulya under Kapha

Nanatmaja Vikara, identifying features such as reduced longevity, excessive sweating, increased appetite, and diminished physical capacity.[7] Sushruta attributed Sthaulya to Dhatwagnimandya (impaired tissue-level metabolism), involving vitiation of Medo Dosha and dysfunction of Medovaha Srotas.[8] Vagbhata explained Sthaulya in terms of Ama formation and disturbed Dhatu Parinamana, characterising Ati-Sthaulya as largely incurable.[9]

According to Ayurvedic physiology, Meda Dhatu metabolism is governed by Medodhatvagni; its impairment leads to the formation of Apakva Meda, triggering Medovaha Srotodushti and Srotorodha, establishing a self-perpetuating cycle of fat accumulation.[10] This framework closely mirrors contemporary concepts of insulin resistance, adipokine dysregulation, and chronic inflammation in metabolic obesity.

Samprapti of Sthaulya

In Sthaulya, Samprapti begins with Kapha-aggravating Nidana — excessive intake of Guru, Snigdha, and Madhura foods, daytime sleeping, physical inactivity, and hereditary predisposition. The resulting Kapha Vriddhi impairs Medodhatvagni, causing accumulation of Apakva Meda. This triggers Medovaha Srotodushti through Sanga and Margavarodha. Obstructed channels confine Vata within the Kostha, stimulating Jatharagni, producing Ativridha Kshudha, and establishing a self-perpetuating cycle of fat accumulation.

Samprapti ghatak

The Samprapti Ghatak of Sthaulya, synthesised from the accounts of Charaka, Sushruta, and Vagbhata, is presented in Table 1.

Table 1: Samprapti Ghatak of Sthaulya

Component	Details
Dosha	Kapha (Kledaka); Pitta (Pachaka); Vata (Samana and Vyana)
Dushya	Rasa Dhatu; Meda Dhatu
Agni	↑ Jatharagni (Tikshnata); Impaired Parthiva and Apya Bhutagni; Impaired Rasa and Meda Dhatvagni
Ama	Dhatvagnimandyajanita Ama (metabolic Ama from impaired tissue fire)
Srotas	Medovaha Srotas
Srotodushti	Sanga (obstruction); Margavarodha (pathway blockage); Excessive Ama and Annarasa flow
Adhisthana	Entire body, particularly Vapavahana and Medodharana Kala
Udbhavasthana	Amashaya
Prasara	Via Rasayani
Roga Marga	Bahya
Vyaktisthana	Whole body; predominantly Sphik, Udara, Stana, Gala

Research Gap and Hypothesis: Despite extensive classical literature on Sthaulya and a growing body of Ayurvedic pharmacological research, head-to-head comparative clinical trials of Kwath and Churna formulations using standardized anthropometric endpoints are lacking. We hypothesized that both formulations would produce significant anthropometric and symptomatic improvements, with Vidangadi Churna offering superior Tridosha-shamaka benefit. The present study was therefore undertaken to compare the clinical efficacy of Patolapatra-Chitrak Kwath and Vidangadi Churna in the management of Sthaulya.

AIMS AND OBJECTIVES

The primary objective of this study was to compare the clinical efficacy of Patolapatra-Chitrak Kwath (Group A) and Vidangadi Churna (Group B) in the management of Sthaulya (obesity) as assessed by validated subjective grading scales and objective anthropometric parameters over a 60-day treatment period.

Secondary objectives included evaluation of the safety profile of each formulation and assessment of overall therapeutic outcome using a composite relief grading system.

MATERIAL AND METHOD

Study design and ethical approval

A prospective, open-label, randomized comparative clinical trial was conducted at our college in (June 2018 – June 2019). The open-label design was necessitated by the fundamentally different dosage forms (liquid Kwath versus solid Churna), which precluded participant or assessor blinding; this is acknowledged as a limitation. The study protocol was approved by the Institutional Ethics Committee (IEC) in accordance with the Declaration of Helsinki. Written informed consent was obtained from all participants prior to enrolment.

Eligibility Criteria

Inclusion: Patients of either sex aged 20–60 years with classical signs and symptoms of Sthaulya and BMI 25–30 kg/m².

Exclusion: Known comorbidities (T2DM, hypertension, hypothyroidism), pregnant or lactating women, predominant Pitta vitiation, concurrent pharmacotherapy affecting body weight, or refusal to consent.

Withdrawal: Adverse drug reactions, missed follow-ups, or voluntary withdrawal.

Randomisation and allocation

Sixty eligible patients were allocated into two groups of 30 using a simple randomization Table. Group A received Patolapatra-Chitrak Kwath (48 mL twice daily, after meals); Group B received Vidangadi Churna

(3 g twice daily, after meals). Treatment was continued for 60 days with follow-up at 15-day intervals.

Enrollment	Patients screened (n = 92)	Excluded (n = 14) Did not meet inclusion criteria: 9 Declined to participate: 3 Other reasons: 2
	↓	
	Patients assessed for eligibility (n = 78)	Excluded (n = 18) Did not meet inclusion criteria: 10 Other reasons: 8
	↓	
	Randomly assigned (n = 60)	
	↓ ↓	
Allocation	Allocated to patolapatradi kwath Gr. A (n = 30)	Allocated to vidangadi churna Gr. B (n = 30)
	↓	↓
	Followed up at 15th day (n = 30)	Followed up at 15th day (n = 30)
	↓	↓
Follow-Up	Followed up at 30th day (n = 30)	Followed up at 30th day (n = 30)
	↓	↓
	Followed up at 45th day (n = 30)	Followed up at 45th day (n = 30)
	↓	↓
Analyses	Followed up at 60th day (n = 30)	Followed up at 60th day (n = 30)
	↓	↓
	Included in the main analyses (n = 30)	Included in the main analyses (n = 30)

Figure 1: CONSORT flow diagram for randomized comparative clinical study

Drug Profile

Table 2: Ingredients of Patolapatra-Chitrak Kwath[11]

S. No.	Ingredient (Ayurvedic Name)	Latin Name	Quantity (g)
1	Patolapatra	Trichosanthes dioica Roxb.	12
2	Chitrak	Plumbago zeylanica L.	12
3	Shatapushpa	Anethum sowa Roxb.	1.5
4	Hingu (Prakshep)	Ferula narthex Boiss.	1.5

Table 3: Ingredients of Vidangadi Churna[12]

S. No.	Ingredient (Ayurvedic Name)	Latin Name	Quantity (g)
1	*Vidanga*	Embelia ribes Burm.f.	0.5
2	*Sunthi*	Zingiber officinale Roscoe	0.5
3	*Yavakshara*	Potassium carbonate	0.5
4	*Loha Bhasma*	Calcined iron (Ferrum)	0.5
5	*Yava*	Hordeum vulgare L.	0.5
6	*Amalaki*	Emblica officinalis Gaertn.	0.5

Outcome Measures

Primary endpoint: Change in BMI (kg/m²) from baseline to day 60.

Secondary endpoints: Change in body weight, waist circumference, hip circumference, mid-arm circumference, WHR, and nine subjective symptom scores; overall therapeutic response; safety profile.

Subjective parameters were evaluated using an investigator-developed 4-point grading scale (0 = absent/normal; 3 = severe). Intragroup changes in subjective parameters were analysed using the Wilcoxon Signed-Rank Test. Anthropometric intragroup comparisons used the paired t-test; intergroup comparisons used the independent t-test.

Table 4: Grading Scale for Subjective Parameters

Symptom	Grade 0	Grade 1	Grade 2	Grade 3
Atisweda Pravritti	Normal sweating	On exertion only	Without exertion; garment change twice daily	Continuous; garment change >2 times/day
Atikshudha	Adequate hunger	Between meals, relieved after 6 h	Every 3 h between meals	Every 1.5 h
Atitrishna	Normal thirst	Occasional	Frequent; not fully relieved by water	Continuous; not relieved by water
Shwaskashtata	Absent	Only on walking	Requires rest during walking	After 10–20 steps
Dourbalya	Absent	Tiredness after routine work	Rest after 2 h continuous work	Unable to work
Angamarda	Absent	Feels able to do activities	Mild disturbance in activities	Avoids day-to-day activities
Sharir Dourgandhya	Absent	Noticed by patient	Unpleasant to others	Noticeable from proximity
Aalasya	Absent	Feels able to do activities	Mild disturbance	Does not want to rise from bed
Nidradhikya	Samyak nidra	8–10 h/day	10–12 h/day	≥12 h/day

Table 5: Overall Therapeutic Response Criteria	
Category	**Criteria**
Excellent	≥75% relief in signs and symptoms
Good	50–74% relief
Moderate	25–49% relief
No Result	<25% relief or no change

RESULT

Baseline demographic and clinical characteristics

Baseline demographic and clinical characteristics were comparable between groups as shown in Table 6; no statistically significant intergroup difference was detected ($p > 0.05$).

Table 6: Baseline Demographic and Clinical Characteristics			
Characteristic	**Group A (n = 30)**	**Group B (n = 30)**	**p-value**
Female, n (%)	26 (87%)	27 (90%)	>0.05
Mean BMI (kg/m², Mean ± SD)	29.17 ± 0.82	28.84 ± 1.09	>0.05
Mean weight (kg, Mean ± SD)	71.22 ± 5.79	71.84 ± 6.98	>0.05
Mean waist circumference (cm)	98.07 ± 7.29	97.47 ± 9.68	>0.05
Kaphapittaja Prakriti, n(%)	19 (63.3%)	16 (53.3%)	>0.05
Married, n (%)	Majority	Majority	>0.05

All p-values by independent t-test (continuous) or Chi-square test (categorical). Age data to be inserted from original case record forms.

Subjective parameter outcome

Table 7: Comparative Percentage Relief in Subjective Parameters				
Parameter	**Gr A % Relief**	**Gr B % Relief**	**Superior**	**Intragroup Significance**
Atisweda Pravritti	49.05%	50.00%	B (marginal)	A: p=0.005; B: p=0.005
Atikshudha	63.63%	63.50%	Equal	Both p<0.001
Atitrishna	70.17%	91.89%	B	Both p<0.005
Shwaskashtata	60.00%	50.00%	A	A: p=0.003; B: NS
Dourbalya	67.14%	73.01%	B	Both p<0.001
Angamarda	66.36%	87.71%	B	Both p<0.001
Sharir Dourgandhya	60.00%	43.33%	A	A: p=0.003; B: p=0.046
Aalasya	96.10%	100.00%	B	Both p<0.001
Nidradhikya	47.36%	52.38%	B	Both p<0.006
Total Subjective	64.42%	67.98%	B (overall)	—

Both groups demonstrated statistically significant intra-group improvement across most subjective parameters ($p < 0.05$). Group B achieved superior overall subjective relief (67.98%) compared to Group A (64.42%).

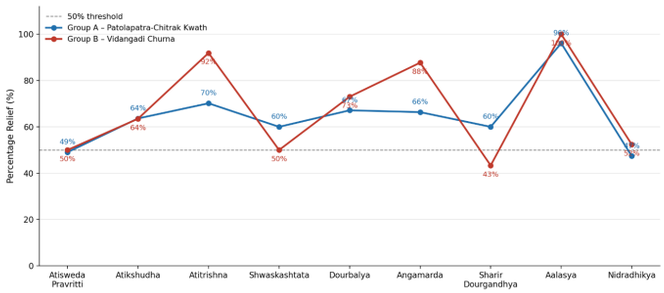

Figure 2: Comparative percentage relief in subjective parameters (Group A vs. Group B)

Objective Anthropometric Outcome

Table 8: Comparative Pre- and Post-Treatment Anthropometric Measures								
Parameter	Gr A BT (Mean±SD)	Gr A AT (Mean±SD)	% Red.	p	Gr B BT (Mean±SD)	Gr B AT (Mean±SD)	% Red.	p
Weight (kg)	71.22±5.79	68.54±5.77	3.76	<0.001	71.84±6.98	69.20±6.71	3.67	<0.001
BMI (kg/m²)	29.17±0.82	28.13±1.03	3.57	<0.001	28.84±1.09	27.75±1.19	3.78	<0.001
Waist Circ. (cm)	98.07±7.29	89.93±6.93	8.14	<0.001	97.47±9.68	91.20±8.80	6.43	<0.001
Hip Circ. (cm)	113.87±7.30	108.23±8.92	4.95	<0.001	112.32±8.29	107.82±9.75	4.00	<0.001
Mid-Arm Circ. (cm)	34.33±1.97	33.23±2.18	3.20	<0.001	34.45±1.98	33.37±1.85	3.13	<0.001
WHR	0.86±0.06	0.83±0.07	3.48	<0.001	0.87±0.06	0.84±0.06	3.44	<0.001

BT = Before Treatment; AT = After Treatment; Circ. = Circumference; WHR = Waist-Hip Ratio; Red. = Reduction (%). Intergroup comparison (unpaired t-test): NS ($p > 0.05$) for all parameters at both time points.

Mean BMI reduction was 1.04 kg/m² (3.57%) in Group A and 1.09 kg/m² (3.78%) in Group B. Despite numerical differences — Group A produced greater waist circumference reduction (8.14% vs. 6.43%) — intergroup comparisons yielded no statistically significant difference for any parameter ($p > 0.05$), indicating broadly equivalent efficacy.

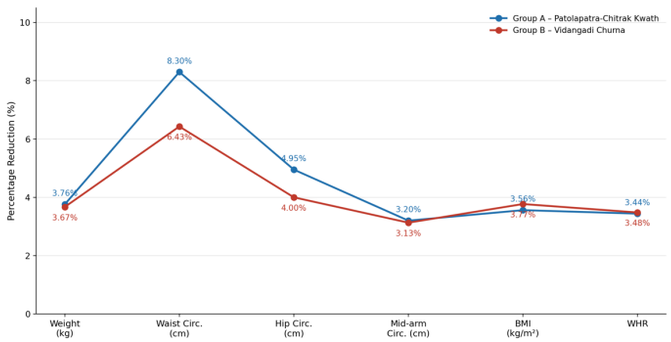

Figure 3: Comparative percentage reduction in objective anthropometric parameters (Group A vs. Group B)

Overall Therapeutic Outcome

Table 9: Distribution of Patients by Overall Therapeutic Response

Response Category	Group A, n (%)	Group B, n (%)
Complete (100%)	0 (0%)	0 (0%)
Excellent (≥75%)	2 (6.7%)	1 (3.3%)
Good (50–74%)	15 (50.0%)	16 (53.3%)
Moderate (25–49%)	12 (40.0%)	13 (43.3%)
No Result (<25%)	1 (3.3%)	0 (0%)
Good + Excellent (success)	17 (56.7%)	17 (56.7%)

Overall treatment success was identical at 56.7% in both groups.

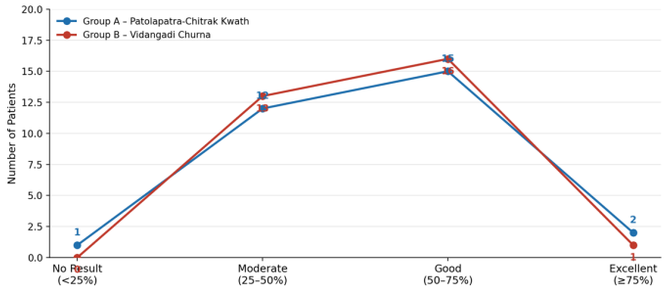

Figure 4: Distribution of overall therapeutic outcome by response category (n = 30 per group)

Safety Profile

In Group A, two adverse events were recorded: (1) per-rectal bleeding in one patient (Grade 1; causality: probable, consistent with Teekshna-Ushna properties of Chitrak; managed conservatively, drug continued); (2) increased menstrual flow in one patient (Grade 1; causality: possible; managed conservatively, drug continued). Both patients completed the trial. No adverse events were reported in Group B. No serious adverse events occurred in either arm.

DISCUSSION

The present study demonstrated that both Patolapatra-Chitrak Kwath and Vidangadi Churna are effective Ayurvedic interventions for the management of Sthaulya (BMI 25–30 kg/m²), producing statistically significant improvements in subjective symptoms and objective anthropometric parameters within a 60-day treatment period.

Pathogenetic rationale

The pathogenesis of Sthaulya centres on Dhatvagnimandya and Srotorodha, leading to progressive Meda accumulation. This mirrors the modern understanding of obesity, wherein insulin resistance, impaired mitochondrial function, and dysregulated adipokine signaling perpetuate positive energy balance. Both formulations were selected on the basis of their classical indications targeting Kapha-Meda Dushti, Deepana-Pachana, and Medodhatvagni enhancement.

Mechanism of action of group A (patolapatra chitrakadi kwath)

Patolapatra (Trichosanthes dioica) possesses Tikta Rasa, facilitating Rasagat Amapachana. Chitrak (Plumbago zeylanica) contributes Ushna Veerya and Teekshna Guna, promoting Medodhatvagni stimulation and fat metabolism. Preclinical studies report that plumbagin, the principal bioactive of Plumbago zeylanica, exhibits lipid-lowering and adipogenesis-inhibiting activity in animal models. Shatapushpa and Hingu facilitate Vatanulomana, relieving Avarodha and perpetuating the pathogenic cycle. The Teekshna-Ushna properties of Chitrak necessitate rigorous Pitta screening, as evidenced by the two adverse events recorded in Group A.

Mechanism of action of group B (vidangadi churna)

Vidangadi Churna exerts a Tridosha-shamaka effect. Vidanga (Embelia ribes) and Sunthi (Zingiber officinale) promote Deepana-Pachana, correcting impaired Dhatvagni function. Experimental evidence supports anti-obesity effects of Embelia ribes, including suppression of pancreatic lipase activity; Zingiber officinale exerts thermogenic and lipid-modulating effects through PPAR pathway modulation. Yavakshara supports Vatanulomana and Srotoshodhana. Loha Bhasma reduces Meda Dhatu Shithilata through Lekhana properties. Amalaki performs Kled Pachana and serves as a Rasayana. Their synergistic action addresses root pathogenesis at multiple levels.

Interpretation of results and clinical significance

The superior subjective relief achieved by Vidangadi Churna — particularly for Atitrishna (91.89%), Angamarda (87.71%), and Aalasya (100%) — may be attributed to its broader Tridosha-shamaka and Deepana-Pachana-Rasayana effects. Group A demonstrated greater efficacy for Shwaskashtata and Sharir Dourgandhya, consistent with stronger Tikta-Kapha-Ama-Pachana activity.

A mean BMI reduction of approximately 1.0–1.1 kg/m² over 60 days is clinically modest. The minimum clinically

important difference for BMI is generally accepted as approximately 1 kg/m² or 5% body weight. Both groups approached but did not fully achieve this threshold, suggesting that longer treatment duration and concomitant lifestyle modification are necessary for clinically meaningful metabolic outcomes. Compared to lifestyle intervention benchmarks (0.8–1.5 kg/m² at 8–12 weeks), results from both formulations are broadly comparable.

The predominantly female demographic (87–90%) aligns with established epidemiological data on obesity in Indian women, where hormonal and socioeconomic factors contribute significantly to excess adiposity. The predominance of Kaphapittaja Prakriti (53–63%) is consistent with classical Ayurvedic descriptions of constitutional predisposition to Medoroga.

Comparison with published literature

Directly published indexed comparators for these specific formulations are limited; most evidence resides in postgraduate thesis studies. In comparable Ayurvedic obesity trials using Kapha-pacifying formulations containing Trikatu or Guggulu, BMI reductions of 2–4% over 60–90 days have been reported, broadly consistent with the present findings. The absence of indexed published trials on these specific formulations underscores the originality of this study. Future researchers are encouraged to search the Dhara Ayurvedic database and CTRI registry for relevant unpublished comparators.

Limitations

The following limitations must be acknowledged: (1) open-label design may have introduced performance bias; (2) 60-day treatment without post-treatment follow-up precludes conclusions on durability of effect or relapse; (3) sample size of 30 per group, while powered for anthropometric endpoints, may be insufficient for smaller differences in subjective outcomes; (4) single-centre design limits generalisability; (5) no biochemical markers (lipid profile, fasting insulin, CRP) were assessed, limiting mechanistic inference; (6) dietary intake was not objectively quantified, introducing a potential confounding variable.

CONCLUSION

Both Patolapatra-Chitrak Kwath and Vidangadi Churna are clinically effective, well-tolerated Ayurvedic interventions for Sthaulya (overweight, BMI 25–30 kg/m²) over a 60-day treatment period. Both formulations produced statistically significant improvements in all objective anthropometric parameters and in the majority of subjective symptom scores ($p < 0.001$). Mean BMI reductions were 1.04 kg/m² (Group A) and 1.09 kg/m² (Group B), with no statistically significant intergroup difference.

Vidangadi Churna demonstrated marginally superior overall subjective relief (67.98% vs. 64.42%), particularly for Atitrishna, Angamarda, and Aalasya, and a favourable safety profile. Patolapatra-Chitrak Kwath achieved numerically greater waist and hip circumference reductions. Overall therapeutic success (≥50% symptom relief) was 56.7% in both groups. Rigorous Pitta screening is required before prescribing Patolapatra-Chitrak Kwath.

Future studies with larger sample sizes, blinded design, prospective CTRI registration, biochemical outcome markers, and longer follow-up are warranted to establish evidence-based Ayurvedic protocols for obesity management.

Author Contribution (credit)

AD: Conceptualisation, data collection, writing – original draft. HP: Supervision, methodology, writing – review & editing. AP: Supervision, writing – review & editing. AS: Data collection, statistical analysis.

GLOSSARY OF AYURVEDIC TERMS

Term	Definition
Sthaulya / Medoroga	Obesity / disorder of adipose tissue metabolism in Ayurveda
Dosha	Three fundamental bio-regulatory principles: Vata, Pitta, Kapha
Dhatu / Meda Dhatu	Body tissue; Meda Dhatu = adipose tissue
Agni / Medodhatvagni	Metabolic fire; Medodhatvagni = metabolic fire specific to adipose tissue
Ama	Undigested metabolic waste / endogenous toxin resulting from impaired Agni
Srotas / Medovaha Srotas	Physiological channels; Medovaha Srotas = channels of fat metabolism
Srotorodha	Obstruction of bodily channels
Samprapti	Pathogenesis; sequential progression of a disease
Samprapti Ghatak	Individual components (Dosha, Dushya, Agni, Ama, Srotas) that define pathogenesis
Deepana-Pachana	Appetitive stimulation and digestion-enhancing therapeutic action
Lekhana	Scraping / emaciation-inducing therapeutic action targeting adipose tissue
Rasayana	Rejuvenating / tissue-nourishing therapeutic action
Kwath	Aqueous decoction dosage form
Churna	Fine powder dosage form
Prakriti	Individual constitutional type determined by dominant Dosha
Nidana	Causative factors/aetiology

REFERENCES

1. World Health Organization. Obesity and overweight [Internet]. Geneva: World Health Organization; 2024. Available from: https://www.who.int/news-room/fact-sheets/detail/obesity-and-overweight
2. GBD 2021 Adult BMI Collaborators. Global, regional, and national prevalence of adult overweight and obesity, 1990–2021, with forecasts to 2050: a forecasting study for the Global Burden of Disease Study 2021. Lancet. 2025;405(10481):813-38. doi:10.1016/S0140-6736(25)00355-1.
3. NCD Risk Factor Collaboration. Worldwide trends in body-mass index, underweight, overweight, and obesity from 1975 to 2016. Lancet. 2017;390(10113):2627-42.
4. Chandrasekaran P, Weiskirchen R. The signalling pathways in obesity-related complications. J Cell Commun Signal. 2024;18(2):e12039. doi:10.1002/ccs3.12039.
5. Sanchez D, et al. Obesity and metabolic syndrome in the 21st century: a narrative review. Cureus. 2025. doi:10.7759/cureus.97204.
6. Tripathi B. Charak Samhita of Agnivesh. Vol. 1. Varanasi: Chaukhamba Surbharti Prakashan; 2018. Sutrasthan, Ashtauninditadhyaya, chapter 21, verse 3. p. 398.
7. Tripathi B. Charak Samhita of Agnivesh. Vol. 1. Varanasi: Chaukhamba Surbharti Prakashan; 2018. Sutrasthan, Maharogadhyaya, chapter 20, verse 17. p. 395.
8. Sharma A. Sushruta Samhita. Part 1. Varanasi: Chaukhamba Surbharti Prakashan; 2022. Sutrasthan, Doshadhatu Mala Kshaya Vriddhi Vijnaniya Adhyaya, chapter 15.
9. Tripathi B. Ashtanghridayam of Shrimadvagbhat. Delhi: Chaukhamba Sanskrit Pratishthan; 2013. Dvividhaupakramaniya Adhyaya, chapter 14, verses 18-19, 31. p. 194.
10. Tripathi B. Charak Samhita of Agnivesh. Vol. 1. Varanasi: Chaukhamba Surbharti Prakashan; 2018. Sutrasthan, Ashtauninditadhyaya, chapter 21, verses 5-7. p. 400.
11. Chunekar KC. Bhavprakash Nighantu of Shri Bhavmishra. Pandey GS, editor. Varanasi: Chaukhamba Bharati Academy; 2015. Sthaulyarogadhikar, chapter 20.
12. Tripathi B. Charak Samhita of Agnivesh. Vol. 1. Varanasi: Chaukhamba Surbharti Prakashan; 2018. Sutrasthan, Ashtauninditadhyaya, chapter 21, verse 23. p. 404.

© The Author(s). 2026 Open Access. This article is distributed under the terms of the Creative Commons Attribution 4.0 International License (https://creativecommons.org/licenses/by-nc/4.0/), which permits unrestricted use, distribution, and non-commercial reproduction in any medium, provided you give appropriate credit to the original author(s) and the source, provide a link to the Creative Commons license, and indicate if changes were made. The Creative Commons Public Domain Dedication waiver (http://creativecommons.org/publicdomain/ zero/1.0/) applies to the data made available in this article, unless otherwise stated.