RESEARCH PAPER

Therapeutic Efficacy of Haritaki Churna with Madhu in Sthaulya (obesity): An interventional pilot study.

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ABSTRACT:

Introduction: In Ayurveda *Sthaulya* is primarily understood as an obstructive pathology. Excessive accumulation of *Meda dhatu* leads to obstruction of the *Srotasas*. This obstacle ultimately hampers the nourishment and proper formation of subsequent *dhatus*. *Charaka* has included *Sthaulya* under *Ashta Nindita Purusha.* He has described *Haritaki churna* for the treatment of *Sthaulya*. *Haritaki* (Terminalia chebula) and *Madhu* (honey) combination is an excellent example of sthaulyahar ayurvedic medication. The *Agni Deepan* and *Medohar* qualities of *Haritaki* along with the *Yogvahi* (universal carrier) quality of Madhu synergistically ensures *Abhyantar Lekhana* (scraping) within the obstructed *srotasas*. *Haritaki* also possesses immunomodulatory, antioxidant, anti-inflammatory and cardioprotective activities, which contribute to its broad therapeutic potential. **Objectives:** In the present scenario *Sthaulya* became a significant public health issue and social burden. The present study was done to evaluate the effect of *Haritaki churna* with *Madhu* in management of *Sthaulya* and to assess the reversibility of disease process. **Materials and Methods:** An interventional pilot study on 30 patients had been planned. They were provided *Haritaki Churna* and advised to take orally twice a day with *Madhu* for 45 days with a regular follow-up after 15 days. **Results:** The analyses were performed by applying Wilcoxan signed rank test within the sample for subjective parameters and paired T test for the objective parameters to evaluate the efficacy and final result was incorporated in terms of probability (p). Less than 0.001 of p value was regarded as statistically significant. **Conclusion:** *Haritaki churna* with *Madhu* produced statistically and symptomatologically better outcomes in the study. Avoiding *Nidana*, maintaining *pathya-apathya* and regular physical activity play a central role alongside medicinal therapy to achieving desirable results.

KEYWORDS: *Sthaulya, Medohar*, *Haritaki, Madhu, Yogvahi,* Lipid profile, BMI, Pilot study.

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INTRODUCTION:

Now a days, obesity has become the most common disorder not even in affluent society but even in middle class. The excessive accumulation of fat in the adipose tissues is generally caused obesity. It also describes a weight increased by 20% or above than the normal weight. Obesity is often expressed in terms of BMI. Obesity is defined as a body mass index (BMI) of 30 kg/m² or greater and is associated with increased morbidity and mortality.[1] Obesity is a leading preventable cause of death worldwide, with increasing prevalence among adults and children with concerned authorities view it as one of the most serious public health problems of the 21st century.[2] It has also seen that the prevalence of obesity was higher among those ager over 40 years and BMI > 30 was about 3% in males and about 14% in females above 40 years. The causes of obesity can be distributed in main three groups: Exogenous (over eating, fatty diets, diminished physical activity), endogenous (Hypothyroidism, Insulinoma) and Genetic factor. There are three main factors in the pathogenesis of obesity: Excessive lipid deposition, Diminished lipid mobilization and Diminished lipid utilization. The clinical manifestation of obesity is gain in weight, protuberant abdomen, development of skinfold around the axilla, below the breast, peritoneal region, and pains, particularly in the knees and lumber spine, dyspnea on exertion. Obesity is a risk factor for coronary artery disease, hypertension, stroke, diabetes mellitus and so on.

Sthaulya has obstructive pathology due to accumulation of srotasas by meda dhatu. Excessive consumption of fatty substances (dietary factors) may cause overproduction of *Medo Dhatu*. This excessive *Meda* formation ultimately contributes to the development of *Sthaulya* by disturbing the normal *Dhatvagni* and metabolic equilibrium.[3] *Acharya Charaka* has narrated *Pratyatma Lakshana* or cardinal symptoms of *Sthaulya* as *Ayushohrasa* (domination of life span), *javoparodha* (lack of enthusiasm), *Krichhra vyavaya* (difficulty in sexual act), *Daurbalya* (general debility), *daurgandhya* (foul smelling of body), *Swedabadhah* (distressful sweating), *Kshudhatimatra* (excessive hunger) and *Pipasatiyoga* (excessive thirst).[4] For obesity, *Charaka* recommends *Karsana* (scraping) therapy, achieved through *Guru Atarpana*.[5]These measures utilize physiologically heavy but non-nutritive foods and regimens that induce depletion of *Meda dhatu* without impairing *Agni* or aggravating *Vata* excessively. *Vagbhata* also mentioned that in obese persons, neither *Brihana* nor *Langhana* therapies can alone provide complete benefit. Hence, the drugs possessing *Medohara*, *Agni Deepana* and *Vata Shamaka* properties are considered beneficial for the effective management of *Sthaulya*.[6] The clinical study is taken up with an aim to study on the efficacy

of *Haritaki churna* in managing *Sthaulya* in 45 days. The overall goals of treatment should highlight prevention of further weight gain, weight loss to achieve a realistic target BMI and long-term maintenance of a lower body weight among the users with a relatively simple herbal formulation.

Table 1. Differential diagnosis of Sthaulya: -

Diagnosis	Inclusion Criteria	Exclusion Criteria
Simple obesity	BMI≥30, sedentary lifestyle, excessive intake of calorie, family history of obesity.	secondary Obesity with respect to endocrine disorders, drugs like glucocorticoids, pregnancy, or other clinical conditions.
Cushing syndrome	Cortisol levels of patient is elevated, Central obesity, hypertension, intolerance to glucose	Patients with known case of Cushing syndrome or normal level of cortisol
Hypothyroidism	Patient with High TSH, or low free T4 and also with undefined weight gain	Obese patient with normal thyroid profile, bradycardia constipation, and intolerance to cold,
Depression	Weight gain or increased appetite, depressed mood, loss of interest	Patient with Emotional changes related to appetite or Guilty feelings
Polycystic ovarian disease and syndrome in female	Patient with Reduced insulin sensitivity, Irregular mensuration, polyendocrine metabolic ovarian syndrome,	In women overian dysfunction required surgical procedure, uterine uncontrolled bleeding, or infertility due to causes despite of PCOS

MATERIALS AND METHODS

Study design: An open level clinical study with nonrandomisation was conducted in the OPD and IPD of Kayachikitsa department of Government Ayurvedic hospital, during 01/04/2025 to 23/09/ 2025. The unit of assignment was the individual participant. Participants were selected using a non-random sampling method and an informed written consent was obtained from all the subjects included in the clinical trial after explaining the trial. All the blood samples were investigated and analysed at the same laboratory. The same investigator assessed the participants for outcome throughout the study, which reduced inter-observer bias but, as the observer was aware of the intervention, symptom rating may have been influenced.

Inclusive criteria: - Age group between 16 yrs to70 yrs irrespective of gender presenting with the classical features of *Sthaulya*. Participants must include with raised lipid profile (S. Triglyceride >150mg/dl, S. cholesterol >200mg/dl) and BMI >30.

Exclusive criteria: - Patients having age less than16 and above the 70 yrs. Patients with any major illness like Chronic liver diseases, cardiac diseases, cancer etc. Hyperlipidaemia due to drugs e.g. glucocorticoids etc. and pregnant women are excluded from this study.

Withdrawal Criteria: Participants are allowed to withdraw due to any personal reason, aggravation of complaints or adverse drug reaction and leave against medical advice.

Ethics and Registration: Ethical clearance was obtained from the institutional ethical committee (IEC) dated by 03/01/2025 with letter number 08, and registered with Clinical Trial Registry of India (CTRI) with the number CTRI/2025/03/082516 before commencement of trial. (https://ctri.nic.in/Clinicaltrials/main1.php?EncHid =60309.98820.)

Intervention:

In this interventional pilot study, 30 patients diagnosed with *Sthaulya* were selected on the basis of raised lipid profile and BMI parameters. All the selected patients were obese primarly. Data from all 30 patients were collected and assessed on the basis of the signs and symptoms of *Sthaulya* described in classical Ayurvedic texts. *Haritaki Churna* 3gm twice daily with *Madhu* after meals orally for 45 days was prescribed to all selected patient.

This preparation consists of fine powder of seed free dry *Haritaki* fruit and is administered with *Madhu* as the *anupana* (adjuvant).[7] *Madhu* works as *Yogavahi* acts as a potent carrier (potentiates the effect of main drug and ensures wide diffusion and bioavailability of drug), it is having qualities like *Lekhana* - it helps to reduce the excess tissue, particularly fat (*Meda*), *Ruksha* (dryness)- that counteracts the wetness/sliminess of *Kapha* and *Sookshma Marga Anusari*- ensures deep action of

the medicine at a cellular level. Thus, it is augmenting the therapeutic effect of *Haritaki*.

Matured dry *Haritaki* fruit (*Shasyani*) in raw form was collected and cleaned, the seed of all the fruits was removed, fruits pulp was separated. The obtained fruits pulp was further dried and cleaned properly. The coarse form of fruit pulp was further grinded to get a 100-sieve fine powder. It was then stored and packed in air tight container with each packet measuring 90 gm. The packets were stored in the OPD, from where medicine was delivered to the patient who follow the inclusion criteria on taking history by principal investigator. All participants were duly informed about the experiment, and made them sure to fill their Informed Consent Forms (ICF) thoroughly. Each 90gm packet of prepared medicine was supplied to every patient and advised to visit regular follow-up after every 15 days for a period of 45 days. All patients were instructed to take the medicine by own. All of them completed the trial successfully without any complication.

Objectives/Hypothesis:

Primary objective: To evaluate the effect of *Haritaki churna* with *Madhu* in management of *Sthaulya* with a marked reduction seen in lipid profile and BMI.

Secondary objectives: To study the reversibility of disease process, if any, after assessing objective and subjective parameters.

Outcome measures:

Primary outcome: Based on improvement seen in clinical symptoms as per Ayurvedic texts which were mentioned in subjective parameters. Assesement and documentation of subjective parameters are done by using a grading scale.

This scale consists of total of six subjective parameters including *Udarvridhi* & *Chalodar, Chala-sphik, shudra-shwasa, Nidraadhikya, Swedatipravriti* & *Daurgandhya*, and *Utsah-nash* each scored as Grade 0 to Grade 3. The assessment was carried out by principal investigator alone.

Table 2: % Distribution of Severity of Subjective Parameters among 30 patients of Sthaulya.

Subjective Parameters	Grade 0	Grade 1	Grade 2	Grade 3
Udara-vriddhi* + *Chalodar	0 (0%)	5 (16.66 %)	15 (50.00 %)	10 (33.33 %)
Chala-sphik	0 (0%)	6 (20.00 %)	16 (53.33 %)	8 (26.66 %)
shudra-shwasa	1 (3.33%)	6 (20.00 %)	15 (50.00 %)	8 (26.66 %)
Nidraadhikya	1 (3.33%)	7 (23.33 %)	16 (53.33 %)	6 (20.00 %)
Swedatipravriti* + *Daurgandhya	0 (0%)	12 (40.00 %)	16 (53.33 %)	2 (6.66%)
Utsah-nasha	1 (3.33%)	7 (23.33 %)	17 (56.66 %)	4 (13.33 %)

Table 3: Grading of subjective parameter

1.	***Udaravridhi*** (visceral obesity) & ***Chalodar*** (Pendulous abdomen)	0	No visible fatty area over abdomen
		1	Visible fatty area over abdomen on sitting position
		2	Visible fatty area over abdomen on sitting and standing position
		3	Pendulous abdomen while walking
2.	***Chala-sphik*** (pendulous buttock)	0	No visible fatty area over buttock
		1	Visible fatty area over buttock on sitting position
		2	Visible fatty area over buttock on sitting and standing position
		3	Pendulous buttock while walking
3.	***kshudra-shwasa*** (Breathlessness)	0	Breathlessness only on strenuous exercise'
		1	Comparatively feeling more shortness of breath during upstairs climbing.
		2	Shortness of breath after walking few minutes on the level or about 100 yards (90m).
		3	Shortness of breath even at rest.
4.	***Nidraadhikya*** (over sleeping)	0	Sleeps 6-8 hrs/day
		1	Sleeps 8-10 hrs/day
		2	Sleeps 10-12hrs/day
		3	Sleeps >12 hrs /day
5.	***Swedatipravriti*** & ***Daurgandhya*** (Over-sweating & Bad body odor)	0	No Sweating no bad body odour
		1	Mild sweating, no bad body odour
		2	Moderate sweating with bad body odour
		3	Excessive sweating and bad body odour present
6.	***Utsah-nash*** (Lethargy)	0	No lethargy.
		1	Lethargy after running.
		2	Lethargy after running and walking both.
		3	Lethargy even at rest

Secondary outcomes: Changes in Lipid profile and BMI measured before the trial started and after the 45 days (treatment period completed).

BMI is calculated as weight in kilograms divided by the square of the height in meters (kg/m2) and for Lipid profile, blood sample were drawn empty stomach for accurate measurements at the laboratory of same institute.

Table 4: Distribution of BMI and categorisation of selected patients

BMI (kg/m2)	Frequency	Percentage	Category
30-35	**24**	**80.00%**	**Obesity Class I**
35-40	5	16.66%	Obesity Class II
>40	1	3.33%	Obesity Class III
Total	**30**	**100%**	

Timeline for intervention:

Evaluation and enrolment of patients were started priorly in the OPD on 01st march 2025. Patients selected for study was commonly noticed a symptom of gradual increase in waist circumference about two and half year back. For one year there was progressive accumulation of adipose tissue over the abdominal region, resulting in a distinct abdominal bulge on both sitting and standing positions. During walking, obvious movement was caused by fat deposition moved to gluteal region. Over the course of eight to nine months, the patient had profuse perspiration, foul body odour, exertional dyspnoea, lethargy, and exercise intolerance. over time the symptoms even occurred at rest. Weight gain and diminished physical capacity make trouble to daily task for 9 to 12 months.

For excluding secondary causes of weight gain, investigations were done. Patients were asked mandatory to go through laboratory investigations like Thyroid function and lipid profile. In female patients, for evaluating polycystic ovarian disease (PCOD) ultrasonography was suggested. Following review of the investigation reports and clinical findings. The enrolled patients were included in clinical trial and also diagnosed with primary obesity.

Treatment was started on 01st April 2025 with 3 gm *Haritaki Churna* 12hourly and *Madhu* as *Anupan* after meals with proper medication and *Anupan* as according to their first visit. Mild improvement in breathlessness and lethargy was seen. No any more complaint of weight gain was noted on second follow-up. There were no any additional improved lipid markers, including lower total cholesterol and triglyceride levels. At the final visit of follow up, subjective symptoms and objective clinical parameters were improved. The final follow-up of all the patients was completed on 23rd September 2025. Overall significant improvement in clinical outcomes and metabolic parameters was observed after following the intervention.

Sample size:

A sample size of 30 was taken with no withdrawal of any patient from trial. The observed data was analysed by using P value (Level of Significance). Less than 0.001 of p value was considered statistically significant. As the research was taken up as a part of post-graduate dissertation work with defined time to complete it, the recursion of participants was closed at the preplanned schedule.

Statistical Analysis: Gathered data of subjective parameters were analysed by using the Statistical package for social sciences (SPSS) 2025 software. Gathered data of objective parameters were analysed by using Excel data analysis tool pack. Based on the normality of data distribution, all quantitative variables were presented as mean, median and standard deviation (SD). The analyses were performed by applying the Wilcoxon signed rank test for subjective parameters. Paired T test was applied for the objective parameters to evaluate the effect of the therapy and finally result was incorporated in terms of probability (p). A p value of <0.01 (which corresponds a 99% confidence for the decision) was regarded as statistically significant.

RESULTS:

Table 5: Synergistic Effect of drug on Subjective Parameters: **(**applying the Wilcoxon Signed Rank test)

Parameter	Mean BT	Mean AT	% Change	Negative Ranks	Positive Ranks	Ties	Z value	W value	P value
Udaravridhi& Chalodara	2.27	1.47	**−35.24%**	26	0	4	−4.41	0.00	<0.001
Chalasphik	2.13	1.37	**−35.94%**	23	0	7	−4.20	0.00	<0.001
shudra Shwasa	2.00	0.80	**−60.00%**	29	0	1	−4.70	0.00	<0.001
Nidradhikya	1.90	0.60	**−68.42%**	29	0	1	−4.70	0.00	<0.001
Swedatipravriti & Daurgandhya	1.63	0.77	**−52.76%**	24	0	6	−4.38	0.00	<0.001
Utsahanasha	1.77	0.57	**−67.80%**	27	0	3	−4.55	0.00	<0.001

Abb.-BT=Before treatment, AT=After treatment, %=Percentage

Table 6: Effect of drug on Objective Parameters:

Parameter	BT (Mean)	AT (Mean)	% Change	SD	SE	t-value	p-value	Significance
Total cholesterol (TC)	279.56	220.56	21.10% ↓	23.58	4.30	13.70	0.0001	Highly Significant
Serum Triglycerides (ST)	234.83	195.03	16.94% ↓	28.23	5.15	7.72	0.0001	Highly Significant
Direct HDL	31.06	36.20	**16.52% ↑**	3.64	0.66	−7.71	0.0001	Highly Significant
Weight	87.90	79.43	9.63% ↓	2.48	0.45	18.64	0.0001	Highly Significant
Body mass index (BMI)	32.41	29.91	7.72% ↓	3.64	0.66	3.76	0.008	Highly Significant

Abb.-SD=Standard deviation, SE=Standard error

Note: The negative % change indicates improvement because HDL increased (beneficial).

The pattern gained by 76.09% which shows significant therapeutic benefit of total patients. A steady dependable action of the therapy on most patients shows the high percentage of moderate responders.

DISCUSSION

Effect Of *Haritaki Churna* with *Madhu* on Subjective Parameters

- **Effect on *Udaravriddhi* & *Chalodar:***

After following treatment, The Wilcoxon Signed Rank Test illustrated a highly statistically significant reduction in *Udaravridhi* associated with *Chalodar*. The mean score reduced from **2.27** to **1.47** in the given test with a **mean difference of −0.80**.It was observed that the enlargement and mobility of abdomen reduced consistently. The Overall improvement was 35.24%**.** The change was highly significant statistically (**Z = −4.41, W = 0.00, p < 0.001**). Data shows significant reduction in the fat accumulation and improvement in cleaning of srotasas. Which indicates the stability and reduced pendulousness of abdomen. *Udara Vriddhi* may cause by either *Vata, Purisha,* or *Meda.* The **outgrowth progression** of abdomen and the adjacent areas indicate the advanced stage of *Meda Vriddhi* and *Srotorodha*. The excessive *Meda* accumulation in the *Sthula Purusha*, combined with the ***Guruta*** of *Meda Dhatu* that leads to loss of ***Sanghata*** (compactness) in surrounding *Dhatus*. The **classical** hallmark **signs** of fully developed *Sthaulya were noticed in this above feature*.

Effect on *Chala Sphik*:

Stastically highly significant reduction in *Chala Sphik* was found by scores after given intervention of Wilcoxon Signed Rank Test. The mean score decreased from **2.13** to **1.37** in given test with a **mean difference of −0.77**. Overall improvement of **35.94% was noticed.** The change dominates the negative rank which shows statistically significant (**Z = −4.20, W = 0.00, p < 0.001**). Reduction in ***Guru–Snigdha Guna*** and restoration of ***Dhatu Sthairya*** includes good improvement. The *chalatva* (shakiness) of body parts/organ highlights the loss of tonicity of respective tissues and the predominance of unctuous *Meda*.[8]

- **Effect on *Kshudra-Shwasa:***

Results also show **statistically highly significant reduction** in *kshudra shwasa.* The mean score decreased from **2.00** to **0.80** in the given test with a **mean difference of −1.20**. Overall **improvement** of **60% was noticed**. A uniform therapeutic response among subjects was indicated by the predominance of negative ranks (29) with no positive ranks. The result was highly significant statistically (**Z = −4.70, W = 0.00, p < 0.001**). Due to removal of ***Kapha-Meda Avarana*** over ***Pranavaha Srotas,*** a marked relief and improvement of respiratory efficiency was noted. Which is generally disturbed due to vitiated *Vata* in the *Koshtha* caused by exertion and excess *Snigdha*, Increased *Kapha*, owing to causal factors (*Nidana*) and the *Ashrayashrayi Bhava* relationship between *Meda* and *Kapha*, *Srotorodha* (obstruction of body channels) from increased *Meda*.[9]

- **Effect on *Nidradhikya:***

The Wilcoxon Signed Rank Test showed a **highly statistically significant reduction** in *Nidradikya*

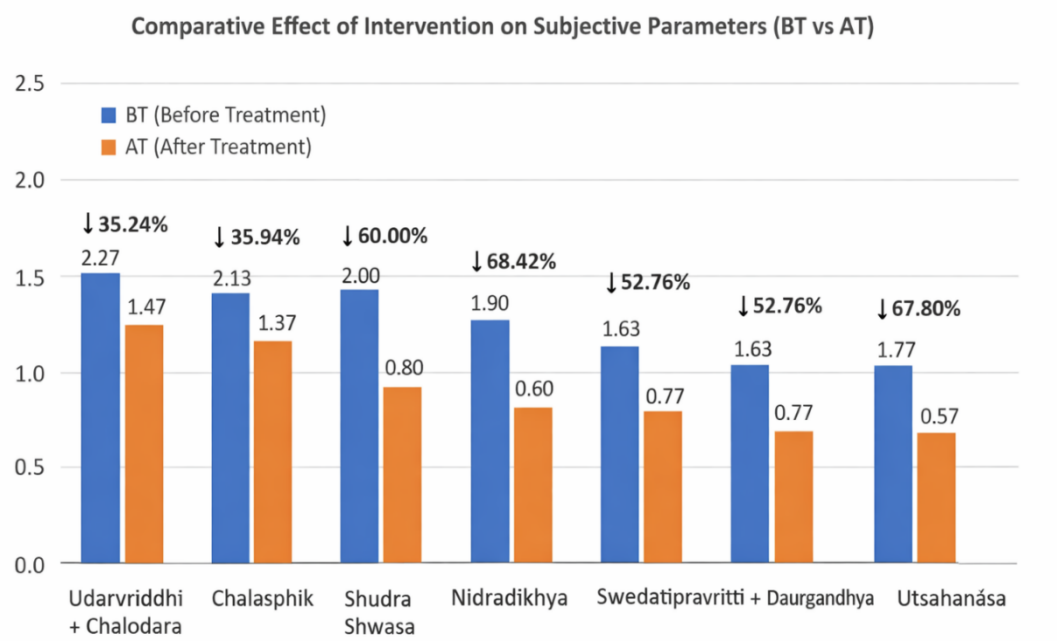
following treatment. The mean score decreased from **1.90** to **0.60 in the given test** with a **mean difference of −1.30**. Overall **improvement of 68.42% was noticed**. A consistent therapeutic effect was illustrated by the presence of **29 negative ranks**, absence of positive ranks, and only one tie The change was highly significant statistically (**Z = −4.70, W = 0.00, p < 0.001**). There is Reduction in the ***Kapha* dominance** and ***Tamasika Nidra Pravriti*** significantly. ***Kaphakara Ahara*** (***Prithvi and Jala Mahabhuta*** predominent) is the main component of *Medovridhi*. ***Kapha Dosha*** and ***Tamo Guna was contributed by both these mahabhutas***. For inducing sleep, *Kapha* and *Tama* are responsible and their abnormal increase results in **excessive sleep**.

- **Effect on *Swedati-pravirtti & Daurgandhya:***

After following treatment, the Wilcoxon Signed Rank Test illustrated a **statistically high significant reduction** in Swedatipravriti associated with Daurgandhya. The mean score decreased from **1.63** to **0.77** in the given test with a **mean difference of −0.86**. Overall **improvement of 52.76% was noticed**. Predominance of negative ranks (24) and absence of positive ranks suggest consistent therapeutic effect and result was statistically highly significant. Improved ***Agni***, reduced ***Ama***, and proper functioning of ***Swedavaha Srotas denotes decreased mean score***. *Sweda* is considered the *Mala* of *Meda Dhatu*. Therefore, By-product of Meda dhatu-*Sweda*—also increases. This results in abundant sweating after giving mild effort. *Snigdha* and *Guru* qualities of *Meda* make the perspiration thick and difficult to evaporate, predisposing to *Daurgandhya*, which becomes a characteristic symptom in this stage.[10]

- **Effect on *Utsaha Nasha:***

The Wilcoxon Signed Rank Test showed a **highly statistically significant improvement** in *Utsahanasha* following treatment. The mean score reduced from **1.77** to **0.57 in the given test** with a **mean difference of −1.20**. Overall improvement of **67.80% was noticed.** A uniform improvement among the study subjects illustrated by the predominance of **negative ranks (27)** with **no positive ranks**. The result was highly significant statistically (**Z = −4.55, W = 0.00, p < 0.001**). Found data indicates the restoration of ***Vyana Vayu*** and improved ***Deha Bala* with *Utsaha***.[11]



Maximum improvement:

- *Nidradhikya* (68.42%)
- *Utsahanasha* (67.80%),
- **60% improvement shown in *Kshudra Shwasa*** (respiratory symptom)**.**
- Classical **Sthaulya features** (*Udaravriddhi, Chalasphik*) showed **~35% reduction**, which is meaningful clinically in obesity-related conditions
- All parameters showed **35–68% mean reduction**. The **z values** ranging from **−4.20 to −4.70 and p value less than 0.001** for all parameters.

Graph 1: - comparative Effect of intervention on Subjective Parameters (BT vs AT).

EFFECT OF HARITAKI CHURNA WITH MADHU ON OBJECTIVE PARAMETERS-

Effect on Serum Total cholesterol: The paired t-test was applied to assess the effect of the intervention on **Total Cholesterol levels**. The mean total cholesterol level markedly reduces from **56 mg/dl** to **220.56 mg/dl** in the given test with a **mean**

reduction of 59 mg/dl. Overall decrease noted here was **21.10%.**

Effect on Serum Triglycerides: The mean triglyceride level reduced from **234.83 mg/dl** to **195.03 mg/dl** in the given test with a **mean reduction of 39.80 mg/dl**. Which is equivalent to **decrease** of **16.94%**.

Effect on Direct HDL: The increased mean HDL level from **31.06 mg/dl** to **36.20 mg/dl** with a **mean rise of 5.14 mg/dl**. Overall **improvement** of **16.52hr% noticed here**.

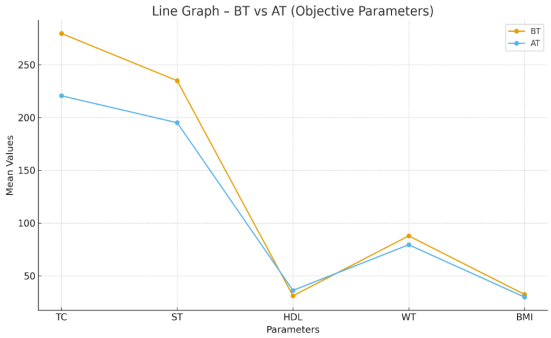
Effect on Weight: The mean body weight reduced from **87.90 kg** to **79.43**, showing a **mean reduction of 8.47 kg**. That is **9.63% decrease** from borderline.

Effect on BMI: The mean BMI decreased from **32.41 kg/m²** to **29.91 kg/m²** in the given test with a **mean reduction** of **2.50 kg/m²**. Overall, **7.72%** decrease from borderline**.**

Objective parameters reinforced the clinical impact of the therapy was reinforced by Objective parameters. Correction of lipid metabolism was indicated by decreasing Total Cholesterol by 21.10% and Serum Triglycerides by 16.94%. Improved cardiometabolic protection was noted by the significant increase of 16.52% of HDL. The *Medohara* and *Lekhana* actions of the interventions further validated by reduction in weight (9.63%) and BMI (7.72%).

All the parameters are significant statistically ($p = 0.0001–0.0008$) confirms that these outcomes are not coincidental. The result of biomarkers highlights improvement of *Medodhatvagni,* and utilization of stored fat with over counter the toxins (*Ama)* by the drug selected for Ayurvedic intervention.

Graph 2. Line graph BT Vs AT (Objective Parameter).



DISCUSSION ON PROBABLE MODE OF ACTION:

Haritaki Churna having properties such as *Madhura, Amla, Katu, Tikta, Kashaya in Rasa, Laghu, Ruksha, Ushna Guna,* with *Anulomana*, *Deepana, Pachana Mrudurechana* actions. It has been taken with *Madhu* as *Anupana* which has *Kashaya, Madhura Rasa, Sheeta Guna* with *Chhedan & Lekhan* properties. Both together work as *Tridosha Shamaka* with *Rasayana* effect. Directly countering the moist and heavy nature of excess fat and *Kapha* because of contraction and drying due to the astringent taste. Directly aids in the *Lekhana* therapy essential for *Sthaulya*. Synergistically the drug improves digestion and burns excess fat by stimulating the ***Jatharagni*** and ***Medodhatwagni***. Due to removal of the obstruction of *Srotas* it restores the proper flow of nutrients and wastes. Disposal of waste and decomposition of fat can be ensured by preventing toxins (***Ama***) formation. For *Sthaulya*, the honey must be ***Purana Madhu*** (aged >1 year) to provide the necessary *Lekhana* effect.

Strength and weakness of the study:

Strength

- The subjective and objective criteria were applied in the study for assessing the parameters.
- Participants were recruited into the trial irrespective of gender, occupation etc.

Weakness:

- The trial was of less duration and conducted only in single group.

Scope:

- Further long treatment durations can include future treatment for chronic and long-standing obesity disorder.
- Variations of therapeutic efficacy and clinical outcomes, can be interpreted to suggest with different *Anupana*.

CONCLUSION

Improvement was illustrated in the management of *Sthaulya* with *Haritaki Churna* in a divided dose of 3 gm twice daily after meal over a treatment period of 45 days with *Madhu* as anupan, with no side effects. The Wilcoxon Signed Rank Test was applied to assess the effect of the intervention on six subjective parameters of *Sthaulya*. After the intervention, all subjective parameters show highly significant improvement of percentage range from 35.24% to 68.42%. It was observed a maximum yield of 68.42% (***Nidradhikya***), 67.80% (***Utsaha Nasha***), and 60% (***kshudra-Shwasa***). Enhanced metabolic function, reduction in *Kapha*-dominant manifestations and improved digestive capability was indicated by above remarkable changes. The Z value ranged −4.20 to −4.70. All changes were highly significant statistically ($p < 0.001$). Even the marked reduction observed in total cholesterol and serum triglycerides was 21.10% and 16.94% respectively. This demonstrates considerable correction in Direct HDL (DHDL) and lipid metabolism levels with a favourable enhancement of 16.52%. This upward improvement was represented by the negative paired t-value. These results are statistically powerful and not due to chance because of consistently significant p-values from 0.0001 to 0.0008 and the paired T-values from 3.76 to 18.64. In the present study, the improvement pattern illustrates clearly a meaningful impact of the treatment protocol administered statistically and clinically. The further interventions with large population and broad diversity may reveal the more

interpretation and scope of *Haritaki churna* with honey.

Author Contribution:

- Conceptualization and management: 1*, 2
- Data collection and literature search: 1*
- Writing – original draft: 1*
- Reviewing & editing: 2
- Approval of final manuscript: All Authors

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