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A Clinical Study of *Bilvadi Panchamula Churna* in the Management of *Sthaulya* (Obesity)

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ABSTRACT

Excess body weight has become a significant health concern worldwide, with its prevalence steadily rising over the past few decades.while there are various approaches to challenge this issue, many individuals are increasingly turning to alternative and holistic healing systems such as Ayurveda to address the root causes of *Sthaulya*. In *Charaka Samhita, Sthaulya* is explained as having pendulous *Sphik*, *Udara* and *Stana* due to excess deposition of *Meda* and *Mamsa* (adipose and muscle tissue) This clinical study designed to investigate the impact of *Bilvadi Panchamula Churna*(BPC),on 30 patients with *Sthaulya* treated at the Outpatient department of National Ayurveda Hospital,Rajagiriya,Sri Lanka.A purposive sample method were used for the patients selection and the data was collected by using specially prepared proforma.Patients who had BMI between 30 - 40 kg/m^2 were included in this study.They were subjected to clinical examination and laboratory investigations to rule out underlying diseases.After confirming that they were free from any occult disease based on the normal laboratory results, The group administered BPC, 6 g twice daily before meals with bee honey (5g) for a period of 8 weeks with a follow up period of 4 weeks.Subjective assessment criteria were the symptoms of obesity with proper grading whereas objective criteria were BMI, body circumference,skin fold thickness, lipid profile and FBS,SGOT,SGPT Data were analyzed by using SPSS statistical Software.BPCreduced most of the signs and symptoms of Obesity, most of the body circumferences, BMI (from 33.55 ±2.47 to 31.12 ± 2.46 kg/m^2) skin fold thickness (Biceps) (from27.44 ±4.71 to 24.26 ± 4.58 mm), serum cholesterol (from 200.59± 46.87 to 186.16± 38.60 mg/dl) fasting blood sugar level (from106.26±17.40 to 97.95+_12.43 mg/dl),SGPT (from31.92±14.97 to 26.91± 9.73U/L) in a statistically significant manner ($p<0.01$) and SGOT (from27.37± 13.79 to 23.24± 8.69 U/L) in a statistically significant manner ($p<0.05$)whereas the improvement of subjective perameteres is statistically significant ($p<0.01$).Analysis of the overall effects showed BPC has significant effective in *Sthaulya* (Obesity).

Keywords:, *Sthaulya,* Obesity, *Bilvadi Panchamula Churna,* Lipid profile, Fasting blood sugar level.

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Introduction

Ayurveda is a compiled and systematized knowledge covering all corners of life, with the aim of realizing Chaturpurushartha. For achieving them, an individual requires an adequate lifespan or longevity. Hence Ayurveda always seeks longevity as one of the main goals. Yet, obesity seems to utterly compromise such a noble cause by reducing one's life expectancy. Since the Vedic period, a healthy and long life has been praised. The body must be maintained, otherwise man can't be healthy. Charakacharya described the features of a healthy body, having equal distribution of Mamsa (muscular tissue) and properly distributed build-up (Pandey A, 2020)

Obesity is a complex health condition that affects the physical, mental, and social well-being of a human being. Due to this, it will affect reducing the longevity of healthy people in several ways. As well as which affects all ages, socioeconomic groups and threatens both developed and developing country.

According to the WHO (World Health Organization, 2020) Obesity is defined as abnormal or excessive fat accumulation that may impair health. Body mass index (BMI) is a simple index of weight-for-height that is commonly used to classify overweight and obesity in adults. It is defined as a person's weight in kilograms divided by the square of his height in meters (kg/m2). According to WHO BMI greater than or equal to 30 is considered obesity and it is again categorized into 3 classes 30.0-34.9-class I obesity (Moderate), 35.0-39.9-class II obesity (Severe) and > 40.0 (very severe) class III Obesity (World Health Organization, 2020)

The prevalence of obesity in adults 13% all over the world in 2016 and over 650 million were suffered from Obese in ageabove18 years are overweight according to WHO records.

Studies from Sri Lanka show a prevalence rate of 25.2% for overweight and 9.2% for Obesity

The prevalence of central Obesity among the elderly was highest at 26.2%.(Katulanda et al., 2010)

In addition,female sex, higher education, urban living, higher income and being in the middle age were shown to be associated with overweight and Obesity in Sri Lankans. Relatively high prevalence of overweight and obesity, particularly, abdominal obesity among adults in Sri Lanka. When considering the complications of obesity, it is associated with increased prevalence of type II

Diabetes mellitus, coronary heart disease, hypertension, osteoarthritis, gallbladder disease, high blood cholesterol, infertility, impotency and several psychological disturbances.

Acharya Charaka has quoted an Atisthaulya (Obesity)under the eight varieties of impediments designated as Astha Nindita Purusha (Pandey A, 2020) Atisthaulya comprise one of them. Acharya Charaka also lists this problem under Samtarpanajanita Vyadhi (Sabnis & Deole, 2020) .Acharya listed eight defects underlying AtisthaulyaPurusha,Ayuhrasa,Javoprodha,Krcchravyavaya, Daurbalya, Daurgandhya,Svedabadha, Atikshudha, Atitrushna (Pandey A, 2020)

When considering the treatment for Sthaulya in Ayurveda, Obesity has to treat weight loss or loss of centimetres in different circumferences, as well as regulating metabolic processes by Ama Pachana and the excess fat to regulate by the functions of Kapha without vitiating Vata. At the management of the disease metabolism correction as well as strengthening the digestive and tissue fire and clear body channels is essential. As well as have to do mainly improve the dietary habits.

AcharyaCharakamentioned Ruksha,Ushna, and Tikshna Guna contained and mainly Kapha,Medas, and Vatasamana drugs likeBilvadi Panchamula with Madhu is considerable medicine for the management of Sthaulya. Which contain five herbs i.e. Bilva, Agnimantha, Shyonaka, Kashmarya and Patala (Pandey A,2020)

Considering all the facts, this clinical trial is designed to investigate the Clinical study of Bilvadi Panchamula Churna in the management of Sthaulya(Obesity) and was undertaken with the following objectives.

Objectives

The general objective of this study is to evaluate the effect ofBilvadiPanchamulaChurnain the Management of Sthaulya.The specific objective of this study are to

To measure the effect of Bilvadi Panchamula Churna in the management of Sthaulya

Materials and Methods

This clinical study was designed to investigate the impact of Bilvadi Panchamula Churna,A total of 30 patients of Sthaulya were registered for this study at the Outpatient department of National Ayurveda Hospital,Rajagiriya.Out of 30, 3

patients dropped out and 27 patients were the study from period of 10th December 2022 - 16th March 2024. (ERC-BMARI/2022/005)

A purposive sample method was used for the patient's selection, and the data was collected by using specially prepared proforma Both male and female patients, between the age of 18 and 60 who had BMI between 30-40 kg/m2 Patients having serious cardiac, pulmonary, renal and hepatic diseases etc, pregnant females and lactating women, Patients have a history of diabetes mellitus, thyroid disorders and uncontrolled hypertension and Obesity due to drugs e.g. Anticonvulsant, Beta-blockers, Corticosteroids were excluded in this study,

They were subjected to clinical examination and laboratory investigationsto rule out underlying diseases. After confirming that they were free from any occult disease based on the normal laboratory results, The group administered Bilvadi Panchamula Churna, 6 g twice daily before meals with bee honey (5g) for a period of 8 weeks with a follow up period of 4 weeks.

Table 1: Composition of *Bilvadi Panchamula Churna*

Ingredient	Botanical Name & Family		Part of used	Ratio
Bilva	*Aegle marmelos* (Corr), Rutaceae		Root bark	1part
Agnimantha	*Premna integrifolia* Linn,Verbenaceae		Root bark	1part
Shyonaka	*Oroxylum indicum* Vent, Bignoniaceae		Root bark	1part
Kashmarya	*Gmelina arborea* Linn,Verbenaceae		Root bark	1part
Pathala	*Stereospermum suaveolens* Roxb, Bignoniaceae		Root bark	1part

Table 2:procedure of administering *Bilvadi Panchamula Churna*

Days	Duration	Drug	*ahapana*	*ıshadhaSevana Kala*
- 56 Days	56 Days	*Bilvadi Panchamula Churna*	*Madhu*	*Pragbhakta* (Before meal)

CriteriaforAssessment

Total assessment of the therapy was done based on relief in the signs and symptoms as well as objective criteria Body weight measurement, Body Mass Index (BMI), Waist/Hip Ratio (W/H ratio), Skin fold thickness. The efficacy of the therapy was assessed based on the following subjective as well as objective criteria. The patients were assessed twice by giving a score before and after the therapy according to the severity of the symptoms. Statistical analysis was carried out to obtain the efficacy of the therapy. The details of the scoring pattern adopted for the main signs and symptoms in the present study were as follows.

Subjective Criteria

Table 3: Grading of Subjective Parameters (Vyas, 2014)

Parameters	Grade
Chala Sphik Udara Stana (Visible Movement In Hip –Abdomen-Breast)	
Absence of *Chalatva* Absence of visible movements (in the areas) with the fast movement	0
Little visible movement (in the areas) after rapid movement like running and skipping	1
Visible movement (in the areas) with brisk walking (133 steps/ min.)	2
Movement (in the areas) even after slow walking (75 steps/min.)	3
Movement (in the areas) even after changing posture	4
Atikshudha: - (Excess Hunger)	

As usual/routine	0
Slightly increased (1 meal(snack or main meal) extra with routine diet)	1
Moderately increased (2 meals(snack or main meal) extra with routine diet)	2
Markedly increased (3 meals (snack or main meal)extra with routine diet)	3
Atitrushna (Excess Thirst)	
Normal thirst (1 to 2 liter per day)	0
Up to 1-litre excess intake of water per day	1
1 to 2-litre excess intake of water per day	2
2 to 3-litre excess intake of water per day	3
More than 3-litre excess intake of water per day	4
Atisveda (Excess sweating)	
Sweating after heavy work and fast movement or in very hot weather	0
Profuse sweating after moderate physical work /play activities	1
Sweating after brisk walking for 1 minute (133 steps)	2
Profuse sweating after slow walking for 1 minute	3
Sweating even at rest or by mild activities in cold weather	4
Kshudrashvasa /Alpashvasa (Dyspnoea on Exeration)	
No Dyspnoea even after heavy work	0
Dyspnoea after moderate work but relieved later and tolerable; dyspnoea by climbing upstairs of 10 steps and time have taken will be more than 15 sec	1
Dyspnoea after little work but relieved later and tolerable; dyspnoea By climbing upstairs of 10 steps and time is taken will be more than 25 sec.	2

Dyspnoea after little work but relieved later and not tolerable; dyspnoea By climbing upstairs of 10 steps and time have taken will be more than 35 sec.	3
Dyspnoea in resting condition	4
Alasya / Utsahahani (Laziness / Lack of Enthusisam)	
No *Alasya* or Lack of Enthusiasm (doing work satisfactorily with proper vigour in time)	0
Doing work satisfactorily with late initiation	1
Doing work unsatisfactorily under mental pressure and takes time	2
Not starting any work on his responsibility and doing little work very slowly	3
Does not take any initiation and does not want to work even after pressure	4
Daurbalya / Alpavyayama (Weakness)	
Can do routine exercise	0
Can do moderate exercise without difficulty	1
Can do only mild exercise	2
Can do mild exercise with very difficulty	3
Cannot do even mild exercise	4
Daurgandhya (Body Odor)	
No odour	0
Bad odour but not offensive	1
Strong odour but can be lessened by the use of deodorants or perfumes	2
Very strong odour even after using fragrances (use of deodorants or perfumes	3
Krcchravyavaya (Difficulty in the sexual act)	
Unimpaired libido & sexual performance	0

Decrease in libido but can perform the sexual act	1
Decrease in libido but can perform sexual act with difficulty	2
Loss of libido & cannot perform the sexual act	3

Objective Criteria

Objective criteria were mainly assessed on the basis of Body Mass Index (BMI) Waist/Hip Ratio, skin fold thickness and Serum Lipid Profile before treatment and after completion of treatment were assessed in terms of percentage relief and statistical evaluations.

Body Mass Index (BMI) (World Health Organization, 2025)

The BMI is a statistical measurement which compares a person's weight and height. The frequent use of BMI is to assess how much an individual's body weight departs from what is normal or desirable for a person of his or her height. For a given height, BMI is proportional to weight. However, for a given weight, BMI is inversely proportional to the square of the height. The BMI is the actual body weight divided by the heights quared in meter (kg/m^2). This index provides a satisfactory measure of obesity in people. The classification of obesity as per BMI is as: Underweight -<18.5kg/m^2,

Normal weight -18.5-24.9kg/m^2,

Overweight -25-29.9kg/m^2,

Obesity (Class-I) - 30- 34.9kg/m^2,

Obesity (Class-II) - 35 - 39.9 kg/m^2, and Morbid Obesity (Class-III) -> 40kg/m^2.

Modified BMI for Asian Population

Underweight -<18.5kg/m^2

Normal weight -18.5-22.9kg/m^2

Overweight -23-24.9kg/m^2

Obesity (Class-I) - 25– 29.9kg/m^2

Obesity (Class-II) - > 30kg/m^2

Skin Fold Thickness (Science Direct, n.d.)

The effectiveness of therapy on body fat was assessed by measuring the skin fold thickness by skin fold thickness caliper before and after the treatment in some areas like:

skin fold thickness of the middle portion of the Biceps muscle, skin fold thickness of the middle portion of the Triceps muscle, skin fold thickness of the abdomen, and skin fold thickness of the middle portion of the supra iliac region.

The skin fold thickness was carried out after exposing the skin properly in the above-mentioned region. The superficial skin along with subcutaneous fat but except muscles a clinch was made and the proportionate, which is stretched as skin fold was measured by placing it between two points of skin fold thickness Caliper. In case of Skin fold thickness, the mean values were taken before and after treatment.

Body Circumference Measurements (Siddharth, 2009)

For the present study the measurements of body circumferences of certain regions using measuring tape before and after the treatment were also carried out. The girth measurement of following areas where generally the adiposity is found more was taken at: Abdomen-At the level of umbilicus, Waist-the waist circumference should be measured at the midpoint between the lower margin of the last palpable rib and the top of the iliac crest, and Hip -At the level of highest point of distension of buttock.

Data analysis

The statistical analysis were performed using the IBM statistical package for social science (SPSS) for version 23. Descriptive statistics such as frequencies, means, standard deviation and percentages will be used. For assessment of subjective parameters by using Wilcoxon signed-rank test and objective parameters Paired and Unpaired student's t-test will be adopted.Student's t-test was applied to the following objective parameters.Students Unpaired't' test is applied for evaluating the difference in the effects of two therapies Objective Parametes.

Table 4: Results interpretation

Non-significant	p>0.05
Significant	p<0.05or p<0.01
Highly significant	p<0.001

Results

The age distribution of the 30 respondents shows that (63.33%) of the participants are between the ages of 46-60, Female (86.66%),majority of respondents have completed O/L education (46.66%), The marital status of the 30 respondents shows that (93.33%) are married ,majority respondents indicates that (80%)are Buddhist, respondents reveals that (60%) live in urban areas,

The subjective assessment criteria included grading the symptoms of obesity, while the objective criteria included BMI, body circumference, skinfold thickness, lipid profile, fasting blood sugar (FBS), SGOT, and SGPT levels. Data were analyzed using SPSS statistical software.*Bilvadi Panchamula Churna* resulted in significant reductions in most obesity-related symptoms, body circumferences BMI (from 33.55±2.47 to 31.12±2.46kg/m^2) skin fold thickness (Biceps) (from27.44±4.71 to 24.26±4.58mm), serum cholesterol (from 200.59±46.87 to 186.16±38.60 mg/dl) fasting blood sugar (from106.26+_17.40 to 97.95+_12.43 mg/dl),SGPT (from31.92±14.97 to 26.91±9.73 U/L) in a statistically significant manner (p<0.01) and SGOT (from27.37±13.79 to 23.24±8.69 U/L) in a statistically significant manner (p<0.05)whereas the improvement of *Chala Sphika Udara Stana*(from 2.37±0.49 to 1.33±0.48)*, Atikshudha* (from2.15±0.45 to 1.15±0.45) *Atitrushna* (from 2.63±0.62 to 1.48±0.64) *Atisveda*(from 2.19±0.622 to 1.15±0.45) *Atinidra,* (from 2.07±0.55 to 1.19±0.68) *Kshudrasvasa* (from 1.93±0.67 to 0.96±0.75) *Alasya* (from 2.22±0.70 to 1.11±0.57) *Daurbalya* (from 2.37±0.62 to 1.12±0.64) *Daurgandhya* (from 1.85±0.62 to 0.89±0.64) *and Kricchravyavaya*(from 1.62±0.49 to 0.65±0.48) is statistically significant (p<0.01).Analysis of the overall effects showed*Bilvadi Panchamula Churna* has significant effective in *Sthaulya*(Obesity).

Table 5: Effect of *Bilvadi Panchamula Churna* on BMI of patients of *Sthaulya*(Obesity)

Parameter	BT		AT		Within the group comparison Paired 't' test
	Mean	SD	Mean	SD	BT-AT
BMI kg/m^2	33.5481	2.47135	31.1185	2.46608	2.43±0.59 t=21.21 p<0.01

AT- After treatment, BT- Before treatment, BMI-Body Mass Index, SD-Standard deviation

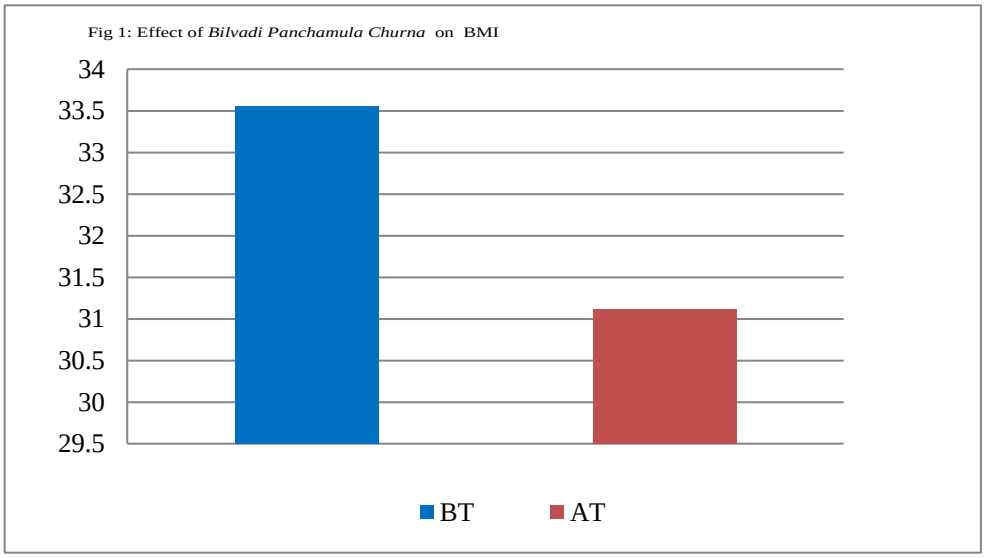


Figure 1: effect of *Bilvadi Panchamula Churna* on BMI

In the analysis of study group, the mean BMI at baseline (BT) was 33.55, with a standard deviation of 2.47. After treatment (AT), the mean BMI decreased to 31.12 with a standard deviation of 2.47, resulting in a significant reduction of 2.43±0.59. The paired t-test indicated a significant reduction in BMI in Group with a t-value of 21.21 and a p-value of less than 0.01.

Table 6: Effect of *Bilvadi Panchamula Churna* on Skin Fold Thickness of patients of *Sthaulya* (Obesity)

Parameter	BT		AT		Within the group comparison Paired 't' test
	Mean	SD	Mean	SD	BT-AT
Skin fold Thickness Biceps mm	27.44	4.718	24.26	4.588	3.19±1.60 t=10.38 p<0.01
Skin fold Thickness Triceps mm	30.33	4.922	26.41	4.492	3.92±1.98 t=10.31 p<0.01
Skin fold Thickness Abdomen mm	37.56	7.250	32.81	7.066	4.74±2.21 t=11.14 p<0.01
Skin fold Thickness Supra iliac mm	34.15	6.043	29.04	5.155	5.11±2.58 t=10.31 p<0.01

AT- After treatment, BT- Before treatment, SD-Standard deviation

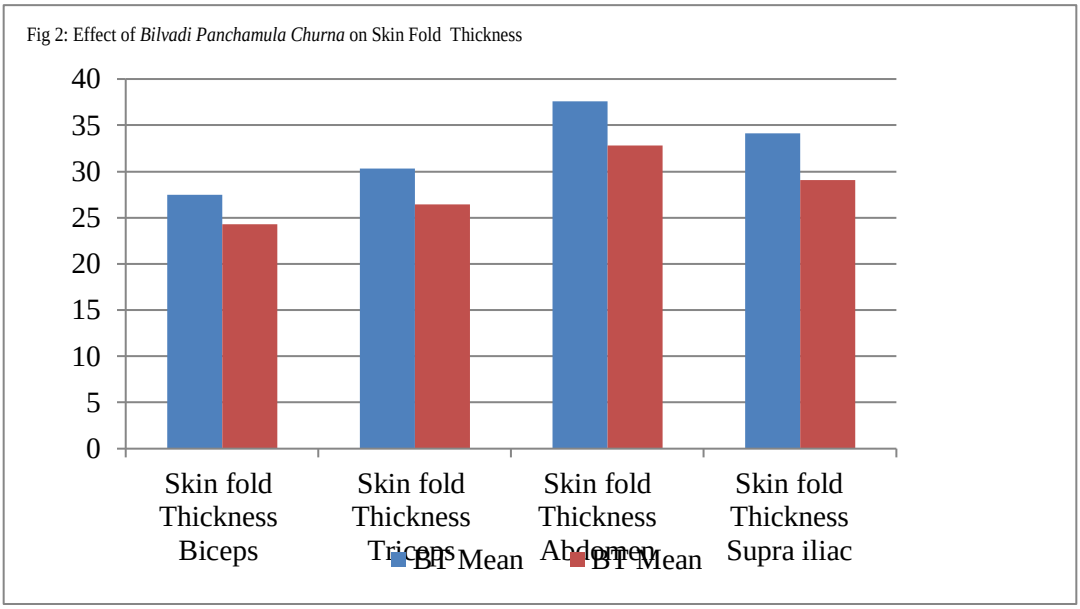


Figure 2: effect of *Bilvadi Panchamula Churna on* Skin Fold Thickness

In evaluating the skin fold thickness of the bicepsof study group, the baseline (BT) mean was 27.44 mm with a standard deviation of 4.72. After treatment (AT), the mean decreased to 24.26 mm with a standard deviation of 4.59, reducing 3.19±1.60 mm. The paired t-test revealed a significant reduction in skinfold thickness for Group with a t-value of 10.38 and a p-value of less than 0.01.

In assessing the triceps skinfold thickness for Group, the baseline (BT) mean was 30.33 mm with a standard deviation of 4.92. After treatment (AT), the mean decreased to 26.41 mm with a standard deviation of 4.49, reflecting a reduction of 3.92±1.98 mm. The paired t-test indicated asignificant reduction in skinfold thickness for Group, with a t-value of 10.31 and a p-value of less than 0.01.

For the measurement of abdominal skinfold thickness in Group, the baseline (BT) mean was 37.56 mm with a standard deviation of 7.25. After treatment (AT), the mean decreased to 32.81 mm with a standard deviation of 7.07, reducing 4.74±2.21 mm. The paired t-test indicated a significant reduction in abdominal skinfold thickness for Group, with a t-value of 11.14 and a p-value of less than 0.01.

In the supra iliac skinfold thickness measurement for Group, the baseline (BT) mean was 34.15 mm, with a standard deviation of 6.04. After treatment (AT), the mean decreased to 29.04 mm with a standard deviation of 5.16, reducing

5.11±2.58 mm. The paired t-test indicated a significant reduction in supra iliac skinfold thickness for Group, with a t-value of 10.31 and a p-value of less than 0.01.

Table 7: Effect of *Bilvadi Panchamula Churna* on Cholessterol,FBS,SGOT and SGPTof patients of Sthaulya(Obesity)

Parameter	BT		AT		Within the group comparison Paired 't' test
	Mean	SD	Mean	SD	BT-AT
Serum Cholesterol mg/dl	200.59	46.87	186.16	38.60	14.43±19.64 t=3.82 p<0.01
FBS mg/dl	106.26	17.40	97.95	12.43	8.31±7.75 t=5.57 p<0.01
SGOTU/L	27.3778	13.79271	23.2481	8.69666	4.13±8.6 t=2.5 p<0.05
SGPTU/L	31.9259	14.97415	26.9148	9.73822	5.01±6.76 t=3.85 p<0.01

AT-After treatment, BT- Before treatment, SD-Standard deviation, FBS-Fasting blood sugar, SGOT-Serum Glutamic Oxaloacetic Transaminase, SGPT-Serum Glutamic Pyruvic Transaminase

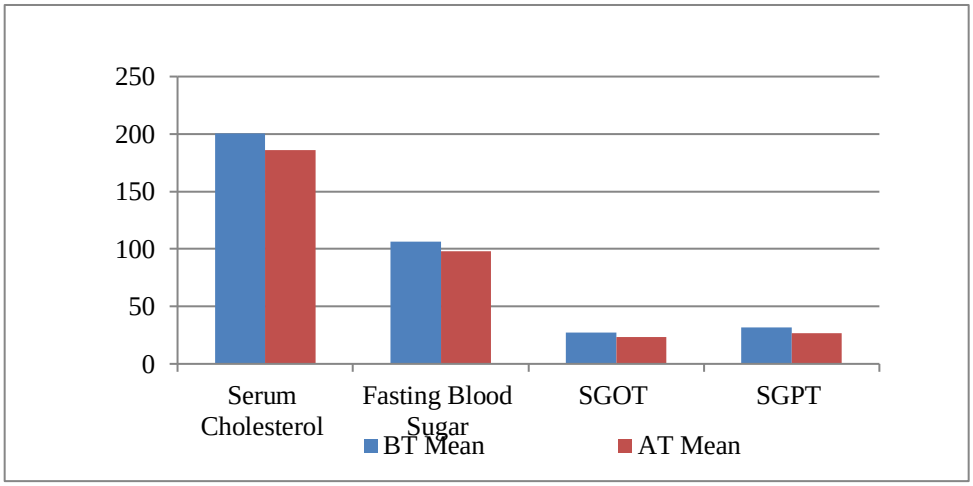


Figure 3: measurement of serum cholesterol

In the measurement of serum cholesterol levels for Group, the baseline (BT) mean was 200.59 mg/dl, with a standard deviation of 46.87. After treatment (AT), the mean decreased to 186.16 mg/dl with a standard deviation of 38.60, reducing 14.43±19.64 mg/dl. The paired t-test indicated a significant reduction in serum cholesterol levels for Group, with a t-value of 3.82 and a p-value of less than 0.01.

For fasting blood sugar levels in Group, the baseline (BT) mean was 106.26 mg/dl with a standard deviation of 17.40. After treatment (AT), the mean decreased to 97.95 mg/dl with a standard deviation of 12.43, resulting in a reduction of 8.31±7.75 mg/dl. The paired t-test showed a statistically significant reduction in fasting blood sugar levels, with a t-value of 5.57 and a p-value of less than 0.01.

In study Group, the SGOT levels showed a mean reduction from 27.38 U/L at baseline (BT) with a standard deviation of 13.79 to 23.25 U/L after treatment (AT) with a standard deviation of 8.70. The difference between baseline and after treatment was 4.13±8.6 U/L, and this reduction was statistically significant with a t-value of 2.5 and a p-value of less than 0.05.

In Study Group, the SGPT levels showed a mean reduction from 31.93 U/L at baseline (BT) with a standard deviation of 14.97 to 26.91 U/L after treatment (AT) with a standard deviation of 9.74. The mean reduction of 5.01±6.76 U/L was statistically significant, with a t-value of 3.85 and a p-value of less than 0.01.

Table 8: Effect of *Bilvadi Panchamula Churna* on subjective criteria

Parameter	BT		AT		Within the group comparison Paired 't' test
	Mean	SD	Mean	SD	BT-AT
Chala Sphik Udara Stana	2.37	.492	1.33	.480	1.04±0.19 t=28 p<0.01
Atikshudha	2.15	.456	1.15	0.456	1±0.48 t=10.82 p<0.01
Atitrushna	2.63	.629	1.48	0.643	1.15±8.6 t=16.48 p<0.01

Atisveda	2.19	.622	1.15	0.456	1.04±0.44 t=12.33 p<0.01
Atinidra	2.07	.550	1.19	0.681	0.89±0.58 t=8 p<0.01
Kshudrasvasa	1.93	.675	.96	.759	0.96±0.65 t=7.71 p<0.01
Alasya	2.22	0.70	1.11	.577	1.11±0.58 t=10 p<0.01
Daurbalya	2.37	.629	1.22	.641	1.15±0.66 t=9.01 p<0.01
Daurgandhya	1.85	.662	.89	.641	0.96±0.65 t=7.71 p<0.01
Kricchravyavaya	1.62	.496	.65	.485	0.96±0.2 t=25 p<0.01

AT-After treatment, BT- Before treatment, SD-Standard deviation

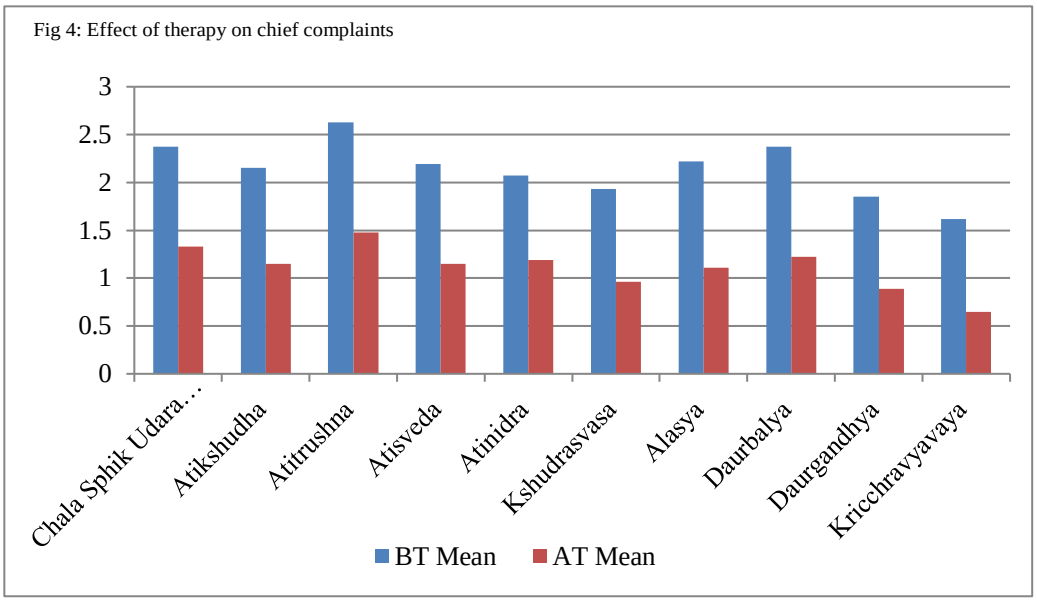
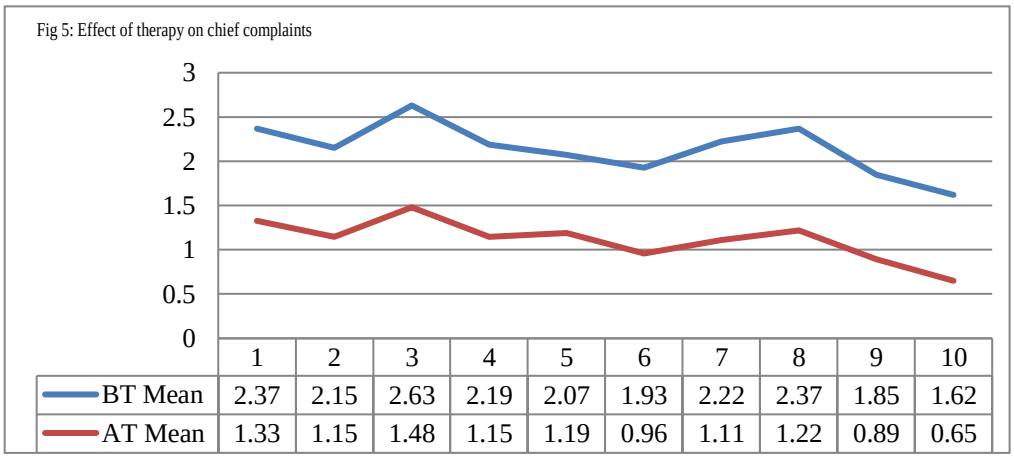


Figure 4: Effect of therapy on chief complaints



	1	2	3	4	5	6	7	8	9	10
BT Mean	2.37	2.15	2.63	2.19	2.07	1.93	2.22	2.37	1.85	1.62
AT Mean	1.33	1.15	1.48	1.15	1.19	0.96	1.11	1.22	0.89	0.65

Figure 5: Effect of therapy on chief complaints

1-*Chala Sphik Udara Stana* 2-*Atikshudha* 3-*Atitrushna* 4-*Atisveda* 5-*Atinidra* 6-*Kshudrasvasa* 7-*Alasya* 8-*Daurbalya* 9-*Daurgandhya* 10- *Kricchravyavaya*

In evaluating the impact of treatments on *Chala Sphik Udara Stana* (Chief Complaints), the paired sample t-test results for study group indicate significant improvement. Group mean score decreased from 2.37 before treatment to 1.33 after treatment, with a significant mean difference of 1.04 ($t = 28$, $p < 0.01$).

results are statistically significant, demonstrating effective treatment of the study group.

For the variable *Atikshudha*, the paired sample t-test results demonstrate significant improvements in study group, the mean score decreased from 2.15 before treatment to 1.15 after treatment, with a mean difference of 1.00 ($t = 10.82$, $p < 0.01$), indicating a substantial treatment effect.also reflecting effective treatment.

For the variable *Atitrushna*, the paired sample t-test results indicate significant improvements in study group, the mean score decreased from 2.63 before treatment to 1.48 after treatment, with a mean difference of 1.15 ($t = 16.48$, $p < 0.01$), reflecting a substantial treatment effect.

For the variable *Atisveda*, the paired sample t-test results reveal significant improvements in the study group, the mean score decreased from 2.19 before treatment to 1.15 after treatment, with a mean difference of 1.04 ($t = 12.33$, $p < 0.01$), indicating a strong treatment effect.

For the variable *Atinidra*, the paired sample t-test results show significant improvements in study group, the mean score decreased from 2.07 before treatment to 1.19 after treatment, with a mean difference of 0.89 ($t = 8.00$, $p < 0.01$), indicating a significant treatment effect.

For the variable *Kshudrashvasa*, the paired sample t-test results indicate significant improvements in study group, the mean score decreased from 1.93 before treatment to 0.96 after treatment, with a mean difference of 0.96 ($t = 7.71$, $p < 0.01$), demonstrating a notable treatment effect.

For the variable *Alasya*, the paired sample t-test results indicate significant improvements in study group, the mean score decreased from 2.22 before treatment to 1.11 after treatment, with a mean difference of 1.11 ($t = 10.00$, $p < 0.01$), reflecting a substantial treatment effect.

For the variable *Daurbalya/Alpavayama*, the paired sample t-test results demonstrate significant improvements in study group, the mean score decreased from 2.37 before treatment to 1.22 after treatment, with a mean difference of 1.15 ($t = 9.01$, $p < 0.01$), indicating a strong treatment effect.

For the variable *Daurgandhya*, the paired sample t-test results show significant improvements in study group, the mean score decreased from 1.85 before

treatment to 0.89 after treatment, with a mean difference of 0.96 ($t = 7.71$, $p < 0.01$), reflecting a significant treatment effect.

For the variable *Kricchravyavaya*, the paired sample t-test results show significant improvements in study Group . The mean score decreased from 1.62 before treatment to 0.65 after treatment, with a mean difference of 0.96 ($t = 25.00$, $p < 0.01$), indicating a substantial treatment effect.

Discussion

This study was designed to investigate the clinical study of *Bilvadi Panchamula Churna*in managment of *Sthaulya* (obesity). Obesity, a condition marked by excessive body fat, is often accompanied by multiple metabolic and physical complaints, including *Chala Sphik Udara Stana* (mobility of buttocks, abdomen, and breasts), *Atikshudha* (excessive hunger), *Atitrushna* (excessive thirst), *Atisveda* (excessive sweating), and *Kshudrasvasa* (dyspnea). Both treatments, rooted in Ayurvedic principles, were assessed for their effects on clinical symptoms, anthropometric measures, and biochemical markers.

Statistical analysis using paired t-tests revealed significant improvements of intervention Group, there was a significant reduction in the primary clinical symptoms such as *Chala Sphik Udara Stana*, with a mean difference of 1.67±0.48 ($t=28$, $p<0.01$), and in *Atikshudha*, with a mean reduction of 1.04±0.44 ($t=10.82$, $p<0.01$). Similarly, *Atitrushna* showed notable improvement (mean difference: 1.15±0.66, $t=9.01$, $p<0.01$), suggesting the formulation's efficacy in reducing excessive thirst and hunger.In terms of anthropometric measurements, significant improvements were observed. *Bilvadi Panchamula Churna*Group showed a mean reduction in BMI of 2.43±0.59 ($t=21.21$, $p<0.01$). Furthermore, significant changes were noted in biochemical markers.*Bilvadi Panchamula Churna*Group exhibited a mean reduction in serum cholesterol of 14.43±19.64 mg/dL ($t=3.82$, $p<0.01$)fasting blood sugar levels showed a marked decrease in *Bilvadi Panchamula Churna*Group showing an 8.31±7.75 mg/dL reduction ($t=5.57$, $p<0.01$).*Bilvadi Panchamula Churna*reduce *Kapha* and *Meda* and correct the proper Agni . Hence, *Bilvadi Panchamula Churna*is correcting *Sroto Avarodha*.Due to this pharmaco Dynamic properties*Bilvadi Panchamula Churna*improves most of subjectives as well as Objective parameters of *Sthaulya* significantly in this study.

Conclusion

The results of this study indicate that *Bilvadi Panchamula Churnais* effective treatments for *Sthaulya* (obesity). The significant reductions in most of the subjective as well as objective parameters of *Sthaulya*, coupled with improvements in key anthropometric measures and biochemical markers, underscore the therapeutic potential of these Ayurvedic formulations. The reductions in BMI and skinfold thickness suggest that treatments target adiposity effectively, while the improvements in serum cholesterol and fasting blood sugar levels indicate broader metabolic benefits.*Bilvadi Panchamula Churna* represents promising natural treatment options for the management of *Sthaulya*. With further research and clinical validation, these Ayurvedic formulations could play a critical role in addressing the growing obesity epidemic in a holistic and sustainable manner.

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