

Effect Of Madhu Haritaki In The Management Of Sthaulya With Special Reference To Obesity With The Help Of Objective Parameters: Experimental Study

Dr Arshiya Khan¹ Dr.Vijay Patrikar² DrHarshala Rajurkar³ Dr. Abhishek Joshi⁴

1. Assistant professor, Department of Swasthavritta and Yoga, Datta Meghe Ayurvedic Medical College Hospital and Research Center Wanadongri, Nagpur
2. Assistant professor Department of Swasthavritta and Yoga, Government Ayurved College, Nagpur
3. HOD & Professor Department of Swasthavritta and Yoga, Datta Meghe Ayurved Medical College & Research Centre, Wanadongri, Nagpur.
4. Associate Professor Dept. of Community Medicine, Jawaharlal Nehru Medical College, Datta Meghe Medical College, Sawangi (Meghe) Wardha

Abstract

Obesity is one of the most serious health problem of current scenario. Prevalent in both developed and developing countries and affecting children as well as adults. Obesity is a key risk factor in occurrence of other chronic and non-communicable disease. Adverse effect of obesity to found in population are hypertension, hyperlipidemia, diabetes, coronary heart disease and glucose intolerance. 1.3% of males and 2.5% of females aged more than 20 years were obese in the year 2008. Obesity is mainly caused by combination of excessive food intake, lack of physical activity, genetic susceptibility. Obesity has reached epidemic proportion in India with morbid obesity affecting 5% of the country's population. In Ayurveda Charka Samhita has mentioned Atisthauya is in Santarpanjanyaroga. Charka has also mentioned MadhuHaritaki as one of the Chikitsa for Santarpanjanyaroga. Haritaki is Rasayana, Laghu and Ruksha in Guna, Madhura in Vipaka, Ushna in Virya, Tridoshashamaka, Anulomaka & Madhu is Sandhana, Chedana, Ruksha and Madhur & Kashaya in Rasa. so it may help to reduce obesity & avoid further serious health problem.

Keywords- Sthaulya, obesity, haritaki, madhu

INTRODUCTION Obesity is one of the leading health issue of 21st century. It is most prevalent form of malnutrition, and as a chronic disease prevalence is present in both developed and developing countries and affecting children as well as adults. Obesity is the 5th leading cause of global death, it leads to 44% of the diabetes burden, 23% of Ischemic heart disease and 7-41% of certain cancer.¹ Earlier it was considered a high income country problem, but nowadays overweight and obesity are also now raising in low and middle income countries, particularly in urban areas. Childhood obesity may leads to higher chance of obesity, premature death and disability in adulthood. It is also associated with future risk of increased breathing difficulties, increased risk of fractures, hypertension, and early chances of cardiovascular diseases, insulin resistance and psychological effects .Obesity is now becomes a key risk factor in natural history of occurring other chronic and non- communicable diseases, the typical time sequence of emergence of chronic diseases following the increased prevalence of obesity should be important in public health planning .The first adverse effects of obesity to emerge in population are hyperlipidemia , hypertension and glucose intolerance, while coronary heart disease and complications of diabetes, such as renal failure started emerging several years later. In current scenario same mortality rates for such diseases will be seen in developing countries as those were prevailing 30 years ago in industrialized countries.1.3% of males and 2.5% of females aged more than 20 years were obese in the year 2008.² Obesity is mainly caused by combination of excessive food intake, lack of physical activity, genetic susceptibility. The magnitude of the problem is evident from many GBD studies^{3,4,5}. Obesity also related with Energy balance. It is also related with socioeconomic status, psychological Factors, family tendencies, education, nature of work, as well as addiction also.

Overweight prevalence was found to be higher among females than males and in urban area than rural areas. Obesity has reached at a level of epidemic proportion in India with morbid obesity affecting 5% of the country's population. Obesity lowers the life expectancy. For Obesity management, medications like Orlistat, Lorcaserin, Phentermine and Topiramite are used by modern medical science but their uses are associated with high rates of GIT side effects and concerns have been raised as it has adverse effects on the Kidneys. Surgical treatments Like, gastric bypass, gastroplasty, jaw wiring have been tried with limited success. We believe in Ayurveda's strength which gives innovative solutions to prevent obesity and further disaster due to obesity. According to *Ayurveda*, *Charka* has included *Atisthaulyain Ashtaunindit Purusha*.⁶ In *Charka Samhita*, *Atisthaulya* is mentioned under *SantarpanjanyaRoga (SantarpaniyaAdhyaya)*.⁷ Causes of *SantarpanjanyaRoga* are mentioned as eating *Guru, Madhura, Sheeta, SnigdhaPadharta, Avyama, Avyavaya, Divaswapnata, Harshada*, etc.⁸ *Charka* has also mentioned *MadhuHaritaki* as one of the *Chikitsa* for *SantarpanjanyaRoga* in the same *Adhyaya*.⁹ *Sushruta, Vagbhata, Madhavidan, Sharandhar, Bhe* have also explained causes and management of *Sthaulya*. Description of *Sthaulya* is also obtained through *Vedas* like *Atharvaveda, Upnishad* like *BruhadaaranyakUpnishad* also in *Agnipurana, BhagvatMahapurana. Haritaki's Rasayana, Laghuand Rukshain Guna, Madhurain Vipaka, Ushnain Virya, TridoshaShamaka, and Anulomaka. Haritaki act as an appetite booster, mild laxative, and mild purgative and also helps in strengthening the digestive system. It helps in building and maintenance of Saptadhatu, balances the Doshas&Dhatu acts as a Rasayana* so it may prove beneficial in order to reduce obesity thus to avoid further serious health problem.¹⁰ *Madhu's Laghu, Ruksha, Grahi, Vilekhana, Vishada, Yogavahi, Medhanashaka, Sandhana, Chedana, Ruksha and Madhur& Kashaya in Rasa*.¹¹ Such beneficial properties of *Madhu* will help in reducing Obesity

Material & Methods

1. Place of Study

The diagnosed patients of *Sthaulya* i.e. obesity (pre-obese & obese class 1) was selected from O.P.Ds & I.P.Ds of our Hospital. Study was carried out in our OPD of our research institute.

2. Type of Study

This is a comparative Randomized Study.

3. Sample size

70 individuals were studied

4. Study Groups

On the basis of obesity parameters, history and clinical examination, total 70 pre-obese and obese class 1 patients was selected from OPDs and IPDs of our institution with their kind permission.

Selection Criteria

INCLUSION CRITERIA

- 1) Well diagnosed pre-obese and obese class 1 category (i.e having BMI between 25-35)
- 2) Age group between 25-50 years.
- 3) With no any other diseases.

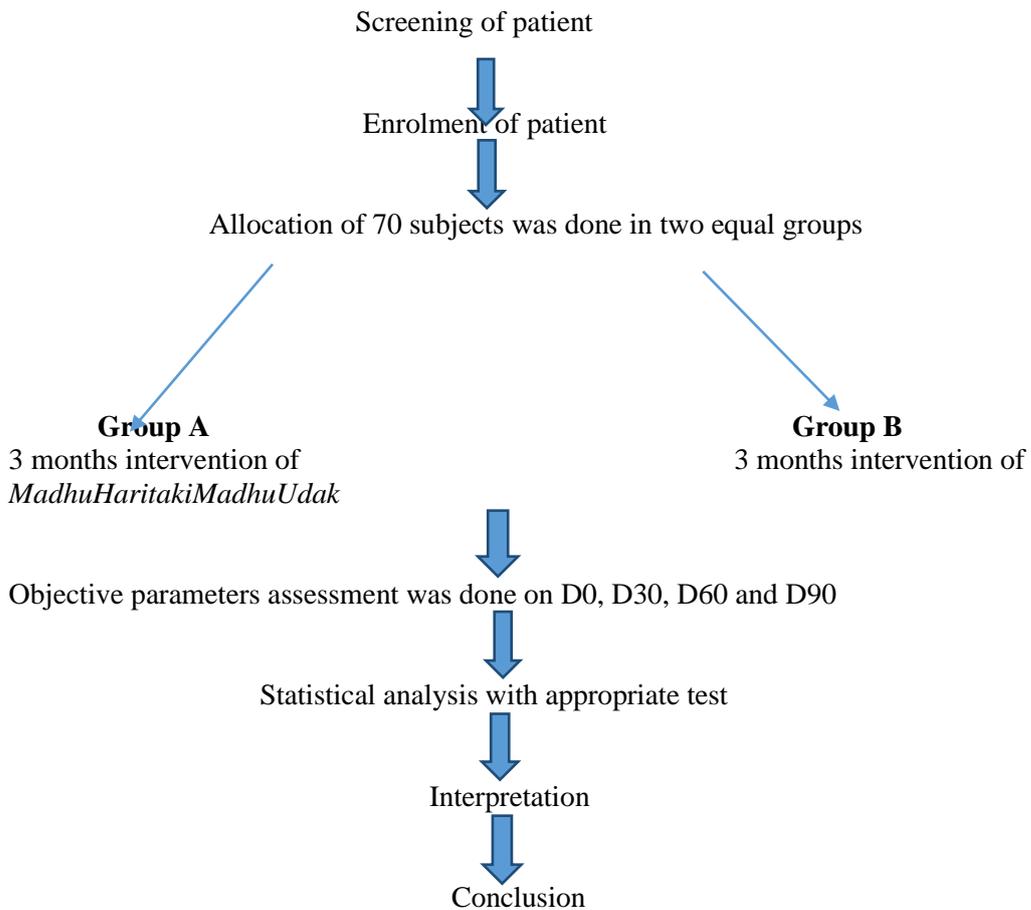
EXCLUSION CRITERIA

- 1) Obesity is present as a result of any other disease and systemic disorder, Genetic obesity.
- 2) ANC, PNC female candidates will be excluded

	Group A	Group B
Drug	<i>MadhuHaritaki</i>	<i>MadhuUdak</i>
Dose	5gm each BD	5gm BD
<i>Anupan</i>	<i>Madhu</i>	<i>KoshnaJala</i>
<i>Bhaishajya Kala</i>	Before meal	Empty stomach
Duration	90days	90days

STUDY DESIGN

Comparative Randomized study



ASSESSMENT CRITERIA

OBJECTIVE PARAMETERS

1) Weight in kg

2) Body Mass Index (BMI)

BMI = weight in kg/ height in meter square

BMI = weight in kg /height in meter square

Classification

BMI

Normal range

18.5 -24.99

Overweight

≥ 25

Pre -obese

25-29.99

Obese class 1	30-34.99
Obese class 2	35-39.99
Obese class 3	≥40

3) Ponderal index=height in cm/cube root of body weight in kg

4) Waist Hip Ratio (WHR) = waist circumference in cm /hip circumference in cm

WHR >1.0 indicates obese in male.

WHR >0.85 indicates obese in female.

5) Abdominal girth

a) 4 cm above umbilicus

b) At the level of umbilicus

c) 4 cm below umbilicus

6) Mid arm circumference

8) Body fat %, visceral fat levels with the help of Karada scan Body composition monitor HBF 375)

OBSERVATION & RESULTS

This clinical study has been started with 70 patients of *Sthaulya* with 35 patients in each group. They were divided into two groups randomly but after drop out, Study was carried out in 65 patients of *Sthaulya* (pre- obese and obese class 1). Group A that means experimental group containing 33 and Group B which was control group containing 32 patients in each group. Patients were enrolled according to inclusion criteria, intervention was done, patients were observed closely, and assessment was done at every one month interval. Before treatment and after treatment data was analyzed statistically. All these observations and results are described and presented graphically as below.

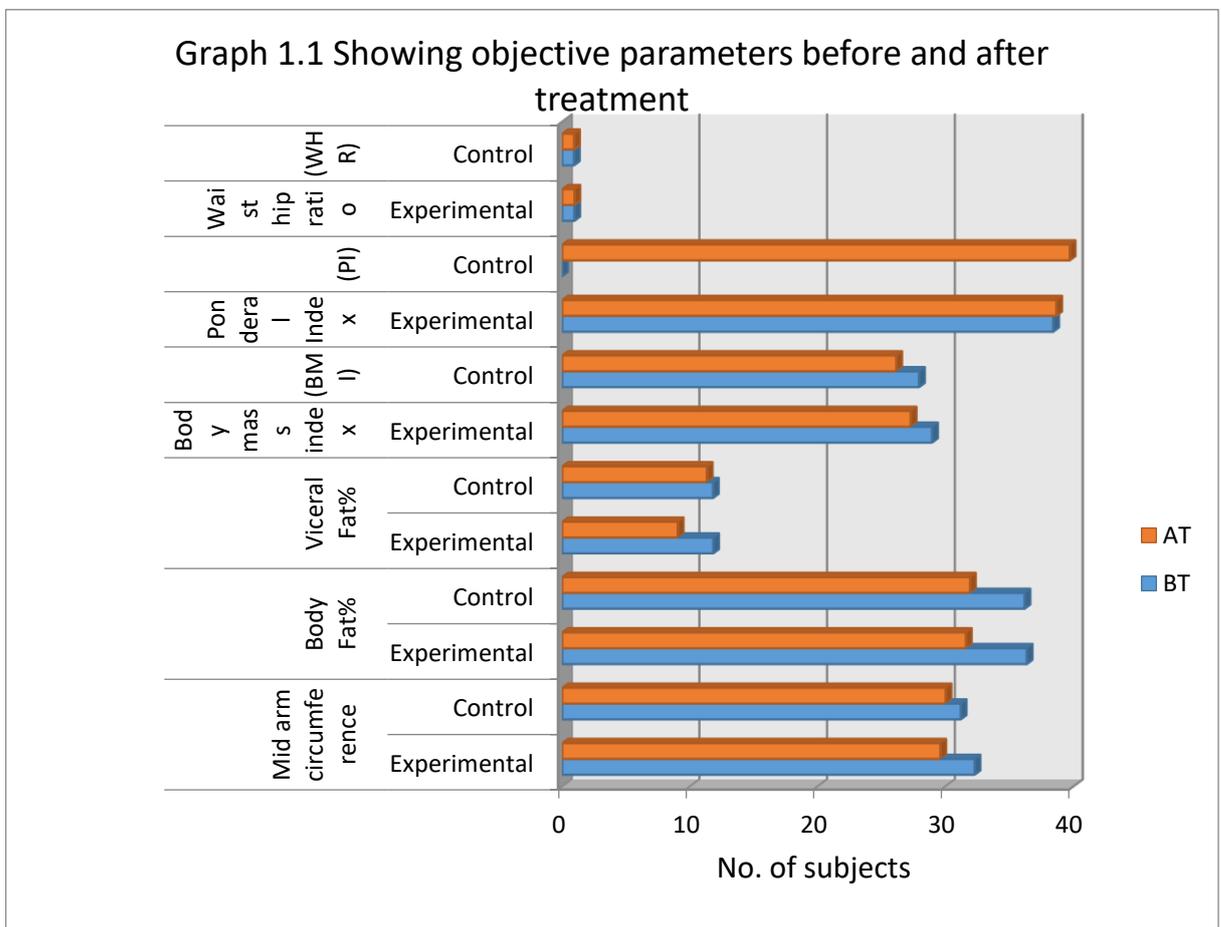
Continuous variables (objective parameters) were presented as Mean ±SD for normalized data. Median and range were calculated for non-normalized data. Objective parameters were compared between before and after treatment in experimental and control groups. Change in objective parameters after treatment between experimental and control group by performing **Wilcoxon rank sum test (Mann-Whitney test)** for non-normalized data. p<0.05 was considered as statistical significance. Statistical software STATA version 14.0 was used for data analysis.

Table.1
Comparison of Objective Parameters Before and After Treatment in Experimental and Control Group

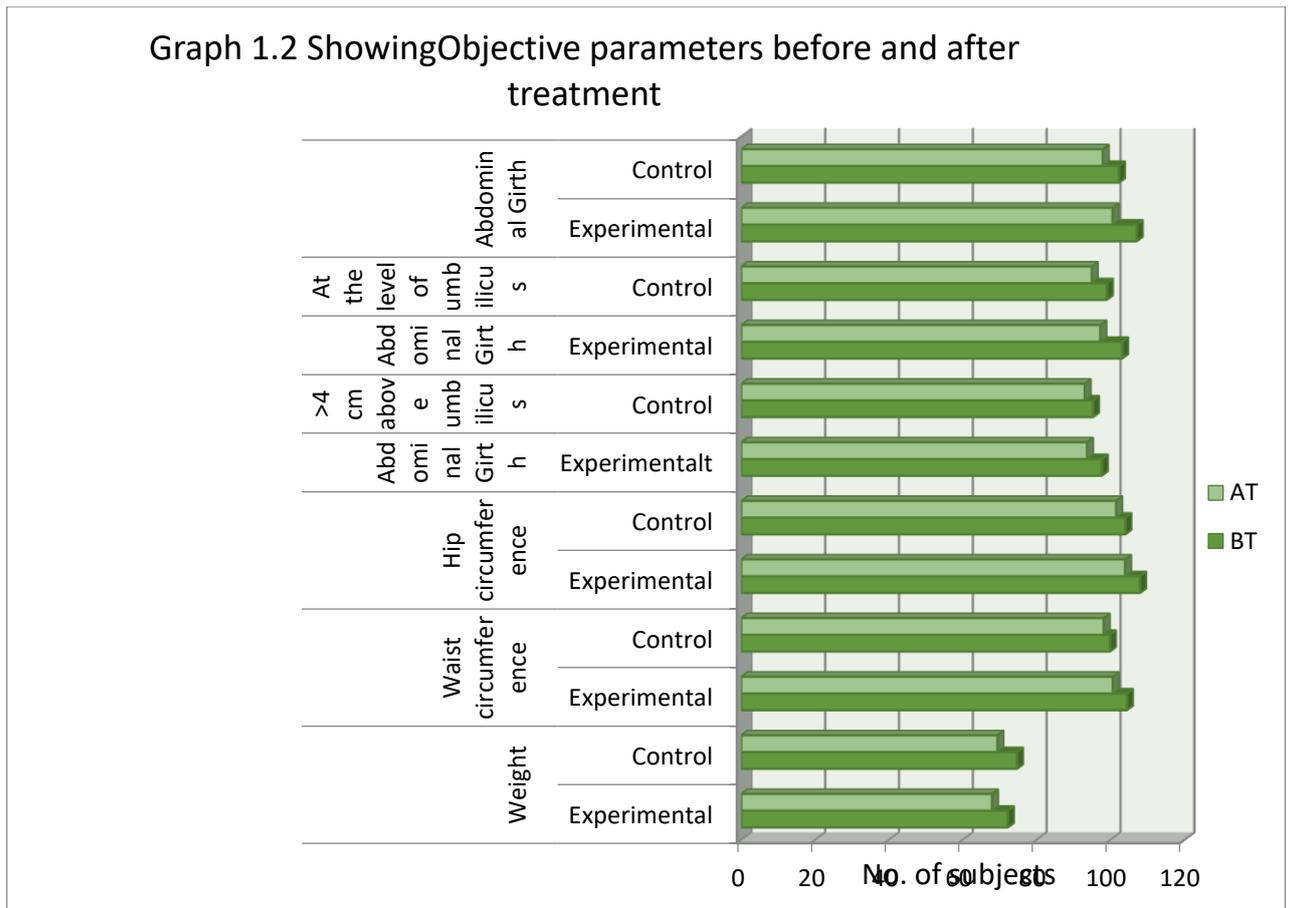
		BT		AT		t-value	p-value
		Mean	SD	Mean	SD		

Weight	Experimental	72.22	14.44	67.93	9.13	2.2781	0.0295, S
	Control	74.69	8.16	69.39	7.56	29.7838	<0.0001, HS
Waist circumference (WC)	Experimental	104.48	9.47	100.63	8.99	14.3227	<0.0001, HS
	Control	99.87	5.59	98.18	5.20	11.6329	<0.0001, HS
Hip circumference	Experimental	108.03	9.03	103.97	8.25	14.7346	<0.0001, HS
	Control	104.06	6.01	101.56	5.25	10.0000	<0.0001, HS
Abdominal Girth >4 cm above umbilicus	Experimental	97.67	10.15	93.68	9.70	11.9592	<0.0001, HS
	Control	95.28	4.78	93.03	4.00	12.1534	<0.0001, HS
Abdominal Girth At the level of umbilicus	Experimental	103.18	8.86	97.27	8.52	14.8713	<0.0001, HS
	Control	99.03	4.73	94.96	3.83	13.0676	<0.0001, HS
Abdominal Girth 4 cm below umbilicus	Experimental	107.12	8.33	100.57	7.64	12.7073	<0.0001, HS
	Control	102.31	5.60	97.93	4.69	15.0796	<0.0001, HS
Mid arm circumference (MAC)	Experimental	32.30	2.89	29.62	2.52	10.2415	<0.0001, HS
	Control	31.21	2.02	30.03	1.64	12.7782	<0.0001, HS
Body Fat%	Experimental	36.38	4.48	31.62	3.72	13.0116	<0.0001, HS
	Control	36.21	3.94	31.94	3.50	18.9376	<0.0001, HS
Visceral Fat%	Experimental	11.84	2.10	9.06	0.24	7.4091	<0.0001, HS
	Control	11.82	2.56	11.34	2.17	5.1121	<0.0001, HS

Body mass index (BMI)	Experimental	28.97	4.98	27.30	2.49	2.0383	0.0499, S
	Control	27.95	1.62	26.17	1.36	15.3094	<0.0001, HS
Ponderal Index (PI)	Experimental	38.45	4.78	38.69	1.27	0.2840	0.7780, NS
	Control	38.88	0.73	39.74	0.70	21.0519	<0.0001, HS
Waist hip ratio (WHR)	Experimental	0.96	0.037	0.97	0.034	1.3962	0.1723, NS
	Control	0.93	0.031	0.94	0.026	2.4522	0.0496, S



Graph 1.2 Showing Objective parameters before and after treatment



Test was applied in experimental group for before treatment and after treatment score, the results were highly significant in the objective parameters such as, Waist circumference, Hip circumference, Abdominal Girth T 4cm above Umbilicus, At the level of umbilicus, 4cm below umbilicus, Mid arm Circumference, Body fat percentage, & visceral Fat % However Significant difference is found in the weight

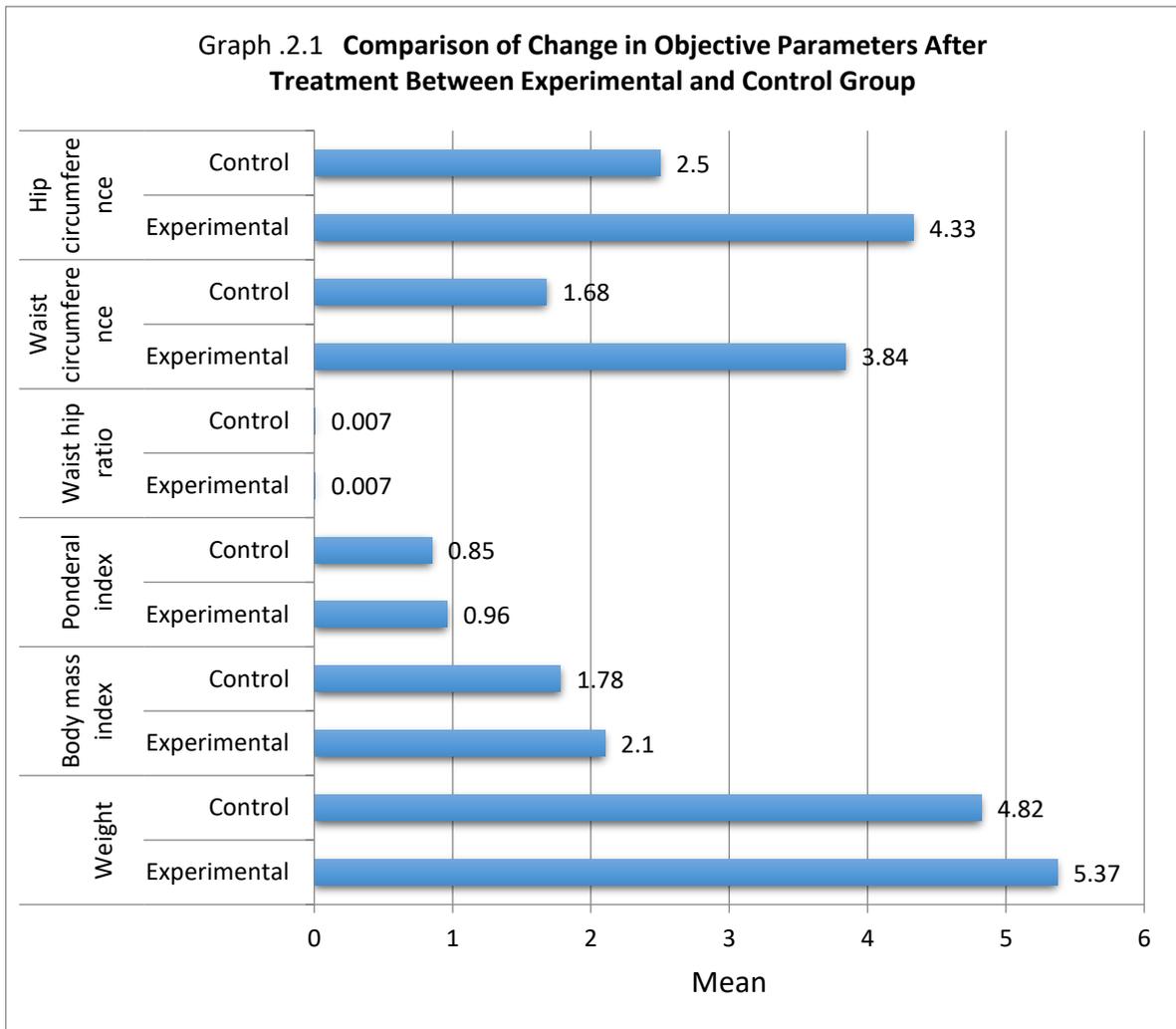
Test was applied in Control group for before treatment and after treatment score, the results were found to be highly significant in the objective parameters such as, Weight, Waist circumference, Hip circumference, Abdominal Girth T 4cm above Umbilicus, At the level of umbilicus, 4cm below umbilicus, Mid arm Circumference, Body fat percentage, & Visceral Fat % .

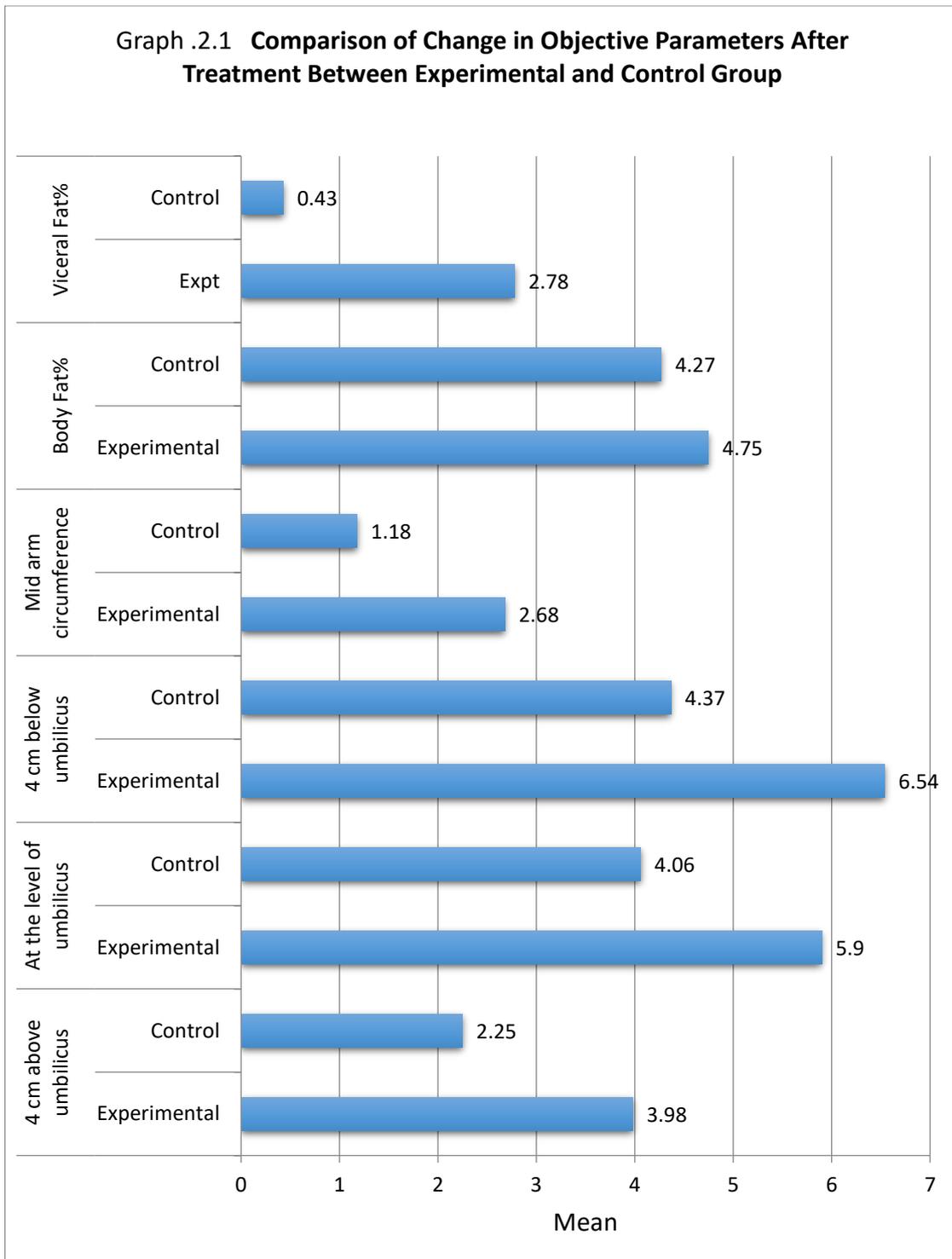
Table.2

Comparison of Change in Objective Parameters After Treatment Between Experimental and Control Group

Parameter	Group	Mean	SD	Median	Range	Z-value	p-value
Weight	Experimental	5.37	1.08	5.4	3.6-7.8	0.999	0.3180,NS
	Control	4.82	1.02	4.6	3.6-6.3		
Body mass index (BMI)	Experimental	2.10	0.39	1.98	1.31-3.29	1.871	0.0614,NS
	Control	1.78	0.30	1.77	1.31-2.23		
Ponderal	Experimental	0.96	0.17	0.93	0.6-	1.372	0.1702,NS

index (PI)					1.47		
	Control	0.85	0.10	0.88	0.69-0.97		
Waist hip ratio (WHR)	Experimental	-0.007	0.011	-0.01	-0.03-0.01	0.169	0.8656,NS
	Control	-0.007	0.007	-0.01	-0.0-0		
Waist circumference (WC)	Experimental	3.84	1.54	4	0-8	5.679	<0.0001,HS
	Control	1.68	0.82	2	0-4		
Hip circumference	Experimental	4.33	1.68	4	1-7	4.151	<0.0001,HS
	Control	2.5	1.41	2	1-6		
4 cm above umbilicus	Experimental	3.98	1.91	4	0-9	4.306	<0.0001,HS
	Control	2.25	1.04	2	1-5		
At the level of umbilicus	Experimental	5.90	2.28	6	1-3	3.817	0.0001,HS
	Control	4.06	1.75	4	1-11		
4 cm below umbilicus	Experimental	6.54	2.95	6	3-16	3.349	0.0008,HS
	Control	4.37	1.64	4	1-8		
Mid arm circumference (MAC)	Experimental	2.68	1.50	3	0.5-7	4.281	<0.0001,HS
	Control	1.18	0.52	1	0.4-2		
Body Fat%	Experimental	4.75	2.10	4.8	1-12.9	1.189	0.2348,NS
	Control	4.27	1.27	4.3	1.5-8.2		
Visceral Fat%	Expt	2.78	2.16	3	2-6	4.330	<0.0001,HS
	Control	0.43	0.50	0	0-1		





Comparison in both groups between before treatment and after treatment values was done by applying Test.

Above table shows that, in case of all the objective parameters there was no significant difference found in weight, BMI, ponderal index, waist hip ratio & body fat % between the results after respective Treatment. Which indicates that both the treatment were equally effective in case of these objective parameters. Whereas Highly Significant difference is found in Waist circumference, Hip circumference, Abdominal circumference at the level of umbilicus, 4cm above umbilicus, 4cm below umbilicus, Mid arm circumference as well as Visceral fat %. This indicates that the experimental treatment is more effective than that of control in these objective parameters, as there was a highly significant difference observed in mean change.

Discussion on Objective parameters

1) Body Weight

After going through statistical analysis, it shows that experimental group has significant different between BT and AT scores of body weight. Whereas control group shows highly significant difference in BT & AT scores, since p value is <0.0001 .

But when we compare both the groups for their effects on body weight, there is no significant difference; hence both therapies are equally effective to reduce weight.

2) Body Mass Index (BMI)

After going through statistical analysis, we can say that experimental group has significant different between BT and AT scores of body mass index. Whereas control group shows highly significant difference in BT & AT scores, since p value is <0.0001 .

But on comparing both the groups for their effects on body mass index, there is no significant difference; hence both therapies are equally effective in reducing BMI.

3) Abdominal Girth

Through statistical analysis we come to know that abdominal girth at the level of 4cm above umbilicus, at the level of umbilicus, 4cm below umbilicus in both groups is found to have highly significantly difference in BT & AT. Since p value is less than 0.0001.

On comparing both the groups for their effects on abdominal girth, there is highly significant difference; hence we can say that experimental group treatment is more beneficial than control group treatment in effect of reducing abdominal girth.

4) Mid Arm Circumference

After observing statistical analysis of before treatment score and after treatment score, it is found that each therapy highly significant difference, since p value is <0.0001

When we compare both groups, it is seen that there is highly significant difference between two therapies, thus we can say that experimental therapy has better effects than that of control.

5) Body Fat Percentage%

Through statistical analysis of before & after treatment score, it is found that each therapy highly significant difference, since p value is <0.0001 .

On comparing both the groups for their effects on Body Fat Percentage%, there is no significant difference; hence both therapies are equally effective in reducing Body Fat Percentage%.

6) Visceral Fat%

From statistical analysis of before & after treatment score, we can say that each therapy highly significant difference, since p value is <0.0001 .

But on comparing both the groups for their effects on visceral fat Percentage%, it is found that there is highly significant difference; hence experimental therapy is more effective in reducing visceral Fat Percentage %as compare to control group.

7) Ponderal Index (PI)

After going through statistical analysis, we can say that experimental group has non -significant different between BT and AT scores of body mass index. Whereas control group shows highly significant difference in BT & AT scores, since p value is <0.0001 .

But on comparing both the groups for their effects on ponderal index, there is no significant difference; hence both therapies are equally effective in reducing ponderal index.

8) Waist hip ratio(WHR)

From statistical analysis, we can say that experimental group has non -significant different between BT and AT scores ofWaist hip ratio. Whereas control group shows significant difference in BT & AT scores, since p value is <0.0001 .

But on comparing both the groups for their effects on Waist hip ratio, there is no significant difference; thus we can say that both the therapies are equally effective in reducing Waist hip ratio.

Few of the related studies were reported by Acharya and Shukla¹², Gaidhane et. al.¹³ and Sagar et. al.¹⁴. Sawal et al assessed the effect of Feminine Obesity on the Outcome of Oocyte in Subfertile Females¹⁵. Pandeet. al. studied relationship of dietary habits and physical activity with BMI in Medical Students¹⁶. Studies on obesity and lipid profile in different groups were reported^{17,18,19,20,21}.

CONCLUSION

- ❖ Following conclusions can be drawn from the present study.
- ❖ Both the therapies *MadhuHaritaki* in experimental group and *MadhuUdak* in control group is effective in reducing *Sthaulyata*. Whereas *MadhuHaritaki* is slightly more effective than *Madhuudak* in reducing *Sthaulyata*.
- ❖ Although Both Experimental therapy and control therapies are beneficial in case of objective parameters like Body weight, Ponderal index, Waist Hip ratio, abdominal girth, mid arm circumference, Fat percentage, Water intake.
- ❖ Experimental therapy is comparatively more effective in reducing abdominal girth, mid arm circumference, visceral fat % & also in reducing water intake and total number of glasses per day.
- ❖ Control therapy was found to be little bit more effective for reducing weight, waist hip ratio, Ponderal index & body mass index but not much significantly. Hence both the therapies are effective in *Sthaulya* (Obesity).

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