CLINICAL STUDY ON EFFICACY OF ANULOMVILOM PRANAYAM IN THE MANAGEMENT OF STHAULYA

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ABSTRACT

Medoroga or sthaulya is a major lifestyle disorder whose prevalence has increased drastically over a past few decades. The world health report of W.H.O listed obesity under the 10 top selected risks to the health. It is well known fact that, in ayurveda management of disease is not all about merely taking the medicine. It is a collective operation of medicine, nidan-parivarjan (abstinence) & lifestyle modification (pathya- apathya). Oxygen is life, a vital force. This vital energy is called Prana. The process of controlling the Prana is called Pranayama. So Pranayama is the science related to vital force supplying energy and controlling the body mind complex.To undertake the management of sthaulya i.e. Obesity, yogic ways of lifestyle modification offers objectless therapy of "Anulomvilom" pranayam through nadi shuddhikriya. Anulom Vilom pranayama help in reducing obesity and feel lightness, improves digestion & Face complexion, diminishes Illness, Mind become stable, calm also reduce laziness from body.

KEYWORDS: Pranayama, sthaulya, obesity.

INTRODUCTION

In Ayurveda sthaulya has been described since very early days in various samhitas, sangraha, Granthas etc. Acharya Charak has described sthaulya among the eight most unwanted diseases (Nindita purusha) and santarpa-janita roga.[1] .Acharya Sushruta also mentioned that madhyam sarira is best but ati sthula and ati krisha are always affected with some diseased conditions[2]. Sthoulya is a notorious disease which disturbs the total metabolic system of the body. Various treatment modalities have been defined for sthoulya in our sahmitas.

Obesity may be defined as an abnormal growth of adipose tissue due to an enlargement of fat cell size or increase in fat cell number or a combination of both. It is often expressed in terms of Body mass index (BMI). The prevalence of obesity was 35.7% among young adults, 42.8% among middle aged adults, 41% among older adults and 10-20% of children & adolescents in developed countries.[3] The incidence of diabetes mellitus, hypertension, angina pectoris & myocardial infarction is higher among obese individuals. it is frequently blamed on ingestion of heavy and over food, endocrine factors, body built or heredity etc.

According to WHO the world wide latest report of prevalence of obesity states the around 250 million cases of obesity are reported every year afflicting about 7% of adult population.[4]

In Hathyog pradipika it is mentioned that "Anulomvilom" pranayam through nadi shuddhikriya helps in reducing obesity, improves digestion, mind becomes stable.[5]

Aim: To study the efficacy of Anulomvilom pranayam in the management of sthaulya.

MATERIALS ND METHODS

Materials- 60 diagnosed patients of sthaulya were selected from Swasthya-vrutta department.

1. Group-A (experimental group)
30 patients were made to perform Anuloma-viloma pranayam daily at morning and evening along with that diet control were advised to follow.

Method of Performing "Anulomvilom pranayam" Procedure
1. Sit in comfortable asana, like padmasan, siddhasan.
2. 1st close your eyes and relax all your muscle for a while.
3. Then inhale from your left nostril while keeping your right nostril closed with the thumb of your right hand.

4. Retain the breath for a few seconds & exhale from your right nostril with your middle and ring fingers closing your leftnostril.
5. Then once again take in the breath from your right nostril, finally exhale from your left nostril while closing your right nostril with your thumb.
6. This will complete one round of the pranayam.
7. Do this for 10minutes early in the morning & evening for 3 months.

2.   Group-B (control group)
Remaining 30 patients were advised to follow diet control only, for 3 months.

Duration of study:- 3 months for both group.
Informed consent:- Informed consent of each patient was taken.

Selection criteria: -
1) All the patients diagnosed as sthaulya irrespective of sex.
2) Body Mass Index(BMI) >Or = 25kg/m2
3) Waist: Hip ratio (WHR)>1.0 in male, >0.85 in female.
4) Age- In between 25 to 55years.
5) Patients having symptoms described in Ayurvedic & modern literature
6) Co-operative, obedient patients who were willing to undergo the prescribed therapy.
7) The patients selected from O.P.D of Swasthya-vrutta department.

Rejection criteria
1) Any other systemic disorders.
2) ANC (ante natal care) &PNC (post natal care) females.

Assessment criteria: All the subjective & objective parameters were noted in each patient of each group, before starting of therapy, after 30 days, 60 days and after 90 days of therapy.

A) Objective parameters
1) Weight (in kg).
2) Body mass index (BMI) (Quetlet's Index)

18.5-24.5- normal range

25-29.99- Pre –obese class
30-34.99 - obese class I
35-39.99 -obese class II
≥40 - obese class III[6]

3) Waist: HIP Ratio (WHR)

WHR >	1.0 indicates obese in male.
WHR >	0.85 indicates obese in female[7]

B)   Subjective parameters
Subjective parameters have been graded as 0,1,2,3 on the basis of Ayurvedic symptomatology as follows
1. Lack of enthusiasm (Karya –anutsaha)
2. Weakness (Daurbalya)
3. Excessive sweating (swedadhikya):
4. Tachypnoea (Kshudrashvasa):
5. Body odour (Daurgandhya)
6. Excessive appetite (Kshudhadhikya)
7. Excessive Sleep (Nidradhikya)[8]

Statistical Analysis
1. Repeated measure of Non parametric test was applied in each group to evaluate the significance of results for subjective parameters and ANOVA was applied to objective criteria.
2. Mann Whitney test were done to evaluate the effect of therapy between the groups subjective parameters.
3. Unpaired t 'test' was applied to compare the effect of treatment between these two groups.

OBSERVATION AND RESULTS

60 patients of Sthaulya were selected randomly as per criteria of selection. Patients were examined prior to the start of intervention.

After complete examination intervention of Anulomvilom pranayam was started while patients were assigned randomly in groups. Experimental group was advised for perform Anulomvilom pranayam daily at morning and evening and it is considered as Group-A. In Control group, were advised to follow diet Control only, for 3 months and it considered as Group-B. After completion of therapy all values of these investigations and examinations were recorded.

Table 1: Group wise Distribution of Patient of Sthaulya.

Group	Exp. Group	Control Group
Intervention	Anulomvilom Pranayama	Diet Control
No of patient	30	30
%	50%	50%

Table 2 Comparison for Subjective Criteria between the groups by Mann- Whitney 'U"Test.

No	Symptoms	Mean ± SD		U'	U	P Value	Result s
		Gr-A	Gr-B				
A.	*Subjective Criteria*						
1	**Karya anutsaha**	0.7±0.46	0.7±0.44	465	435	0.825	NS
2	**Daurbalya**	0.8±0.37	0.5±0.57	587.5	312.5	0.03	*
3	**Swedadhikya**	0.7±0.44	0.6±0.47	480	420	0.654	NS
4	**Kshudrashvasa**	0.9±0.30	0.7±0.46	540	360	0.172	NS
5	**Daurgandhya**	0.7±0.46	0.7±0.46	450	450	0.99	NS
6	**Kshudhadhikya**	0.7±0.46	0.6±0.49	495	405	0.50	NS
7	**Nidradhikya**	0.7±0.46	0.4±0.50	555	345	0.11	NS

The Difference between before and after intervention score of both group compared by 'Mann-Whitney U Test'. It was found that symptoms Karya anutsaha , Swedadhikya, Kshudrashvasa, Daurgandhya, Kshudhadhikya, Nidradhikya which was not significant at 5% level of significance as the p value > 0.05 hence in these symptoms both intervention are equally effective statistically.

In symptom Daurbalya the p value obtained was < 0.05 which shows that there is difference in Experiment group and Control group statistically.

Table 3: Comparison Between Group w.r.t Objective parametrs of 60 Patients of Sthaulya (Test Applied was Unpaired T –Test).

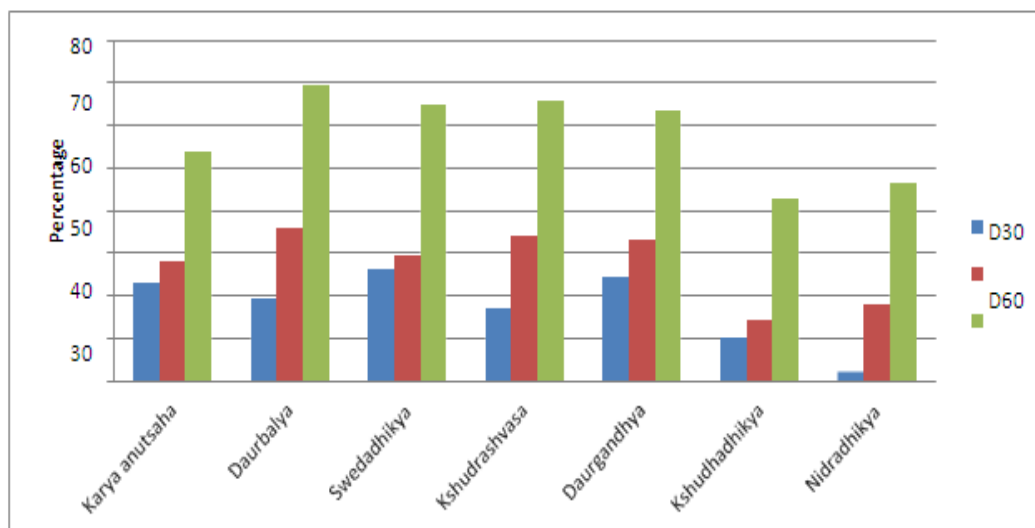| No	Parameters		Mean ± SD	±S Ed	t Value	p Value
1.	Weight	EG	2.34±0.34	0.06	10.62	0.0001
		CG	1.44±0.30	0.02		
2	BMI	EG	0.87±0.13	0.02	9.69	0.0001
		CG	0.55±0.11	0.02		
3	Waist Hip Ratio	EG	0.02±0.004	0.0007	5.20	0.0001
		CG	0.01±0.006	0.001		

For comparison of Objective parameters of 60 Patients of Sthaulya 'Unpaired test' was applied for both experimental and Control group. Regarding the Weight the Mean □ SD of Exp. Group was 2.34±0.34 and in Control Group, it was 1.44±0.30 where reduction of weight is more in experimental group than in Control group and t value obtained is 10.62 with p value obtained is < 0.001 which is extremely significant statistically. So it can be concluded that there is difference in both group statistically. Experimental group intervention is better than Control group intervention.
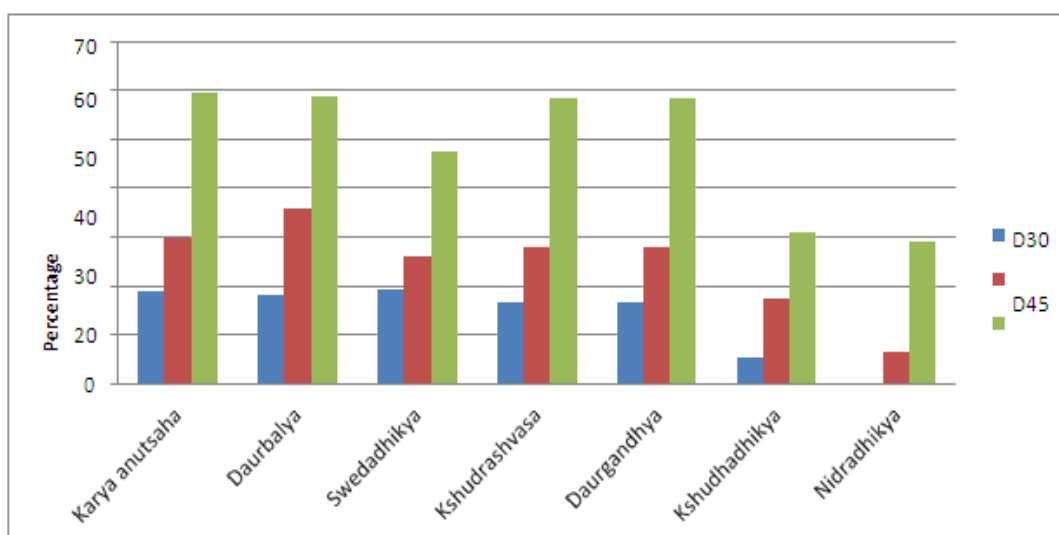
Like in BMI (Body Mass Index) and Waist Hip Ratio the p value obtained is <0.001 which can be considered as extremely significant statistically. So it can be concluded that there is difference in both group statistically and Experimental group intervention is better than Control group intervention.

Table 4: Percentage of Relief (Subjective Criteria) in Each Symptom of 60 Patients of Sthaulya.
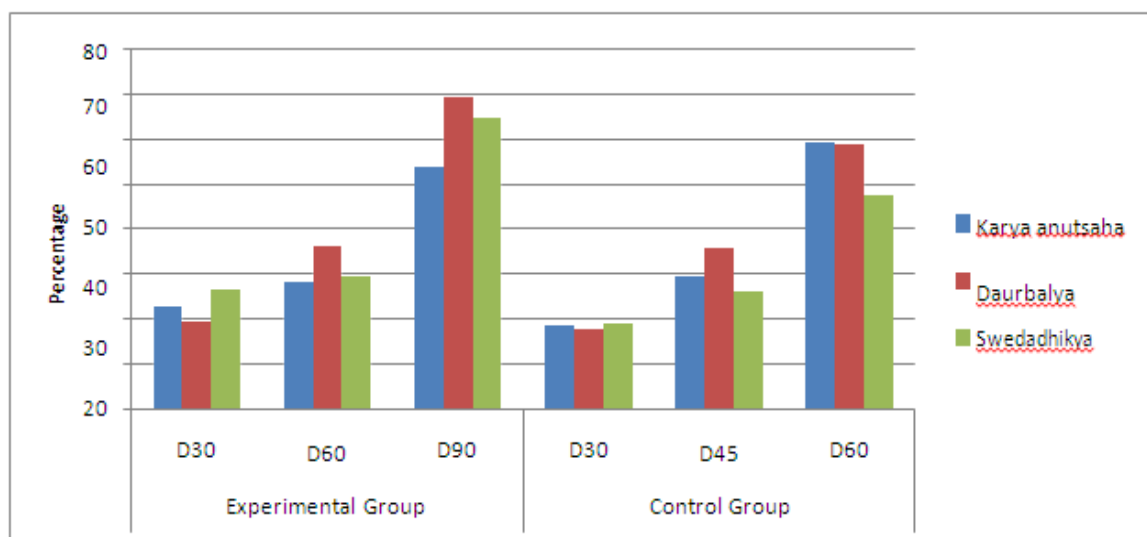
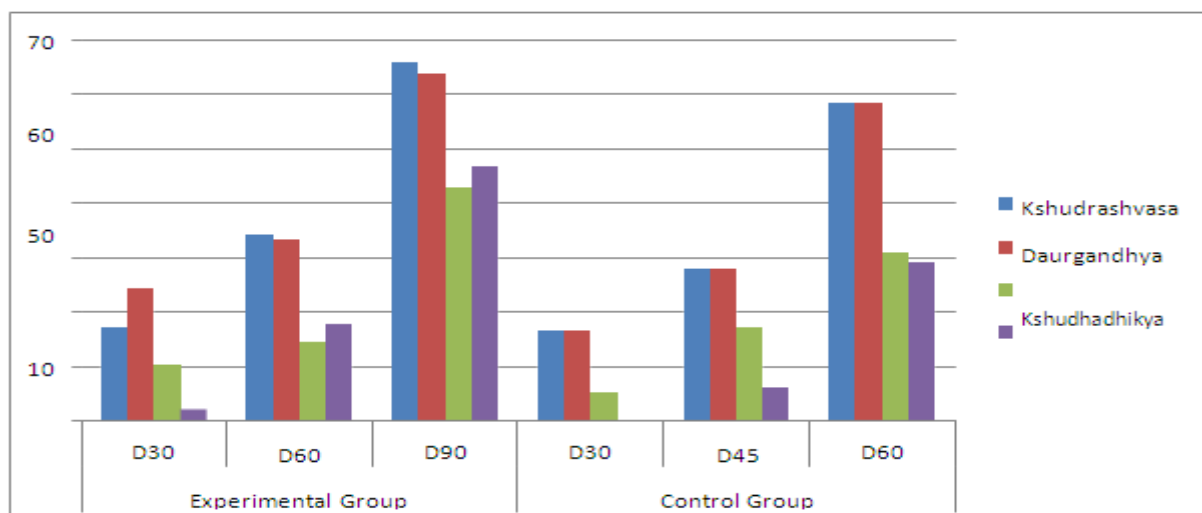| Sr. No.	Symptoms	Experimental Group			Control Group		
		D30	D60	D90	D30	D45	D60
1	Karya anutsaha	23.07	28.20	53.84	18.91	29.72	59.45
2	Daurbalya	19.44	36.11	69.44	17.94	35.89	58.97
3	Swedadhikya	26.47	29.41	64.70	19.04	26.19	47.61
4	Kshudrashvasa	17.07	34.14	65.86	16.66	27.77	58.33
5	Daurgandhya	24.24	33.33	63.63	16.66	27.77	58.33
6	Kshudhadhikya	10.20	14.28	42.84	5.17	17.24	31.03
7	Nidradhikya	2.22	17.77	46.67	00	06.25	29.16

Graph 1: Percentage of Relief in Symptoms in Experimental Group.

Graph 2: Percentage of Relief in Symptoms in Control Group.

Graph 3: Comparison in both group for Percentage relief of Sthaulya in Karya anutsaha, Daurbalya & Swedadhikya.

Graph 4: Comparison in both group for Percentage relief of Sthaulya in Kshudrashvasa, Daurgandhya, Kshudhadhikya and Nidradhikya.

Percentage of Relief in Each Patient of Sthaulya
Overall it was observed that Percentage of Relief in Each Patient of 60 Patients of Sthaulya in experimental group was 59.99 while 48.89 % in Control group. On an average in both group 54.44 % relief got in each patients of Sthaulya.

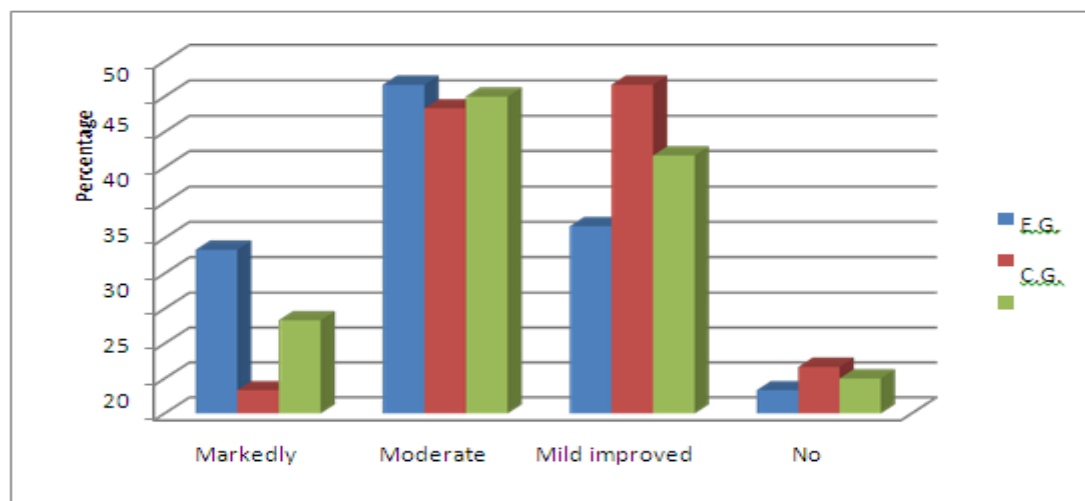**Table 5: Total Effect of therapy in 60 Patients of Sthaulya.**

Sr. No	Effect Of Therapy	No. Of Patients			Percentage %		
		E.G.	C.G.	Total	E.G.	C.G.	Total
1.	Markedly Improved >75%	07	01	08	23.33	3.33	13.33
2.	Moderate improved (51-75%)	14	13	27	46.67	43.33	45.00
3.	Mild improved 26-50 %	08	14	22	26.67	46.67	36.67
4.	No improvements <25%	01	02	03	03.33	06.66	5.00

In Experimental Group, 07 [23.33%] patients were markedly improved,14 [46.67 %] were moderately, 08 [26.67 %] patients were mild improved, while single patients was in no improvement category.

In Control Group, only one patient was improved markedly, 13 [43.33%] patient were moderately improved, 14 [26.67%] patients were mild improved and 02 [03.33%] patients were not able to improve the conditions.

Totally, 08[13.33%] patients were markedly improved, 27[45%] patients moderately, 22[36.67%] were mild improved and 03[5%] were unchanged.

Graph 5: Total Effect of therapy in 60 Patients of Sthaulya.

DISCUSSION

Effect on Percentage of relief in each symptom: (Subjective Criteria)

In experimental group, the percentage of relief noted on Day 30 was observed as 23.07% in Karya anutsaha, 19.44% in Daurbalya, was 26.47%, in Swedadhikya, 17.07% in Kshudrashvasa, 24.24% in Daurgandhya, 10.20% in Kshudhadhikya and 2.22% in Nidradhikya.

On Day 60 it was observed as 28.20% in Karya anutsaha, 36.11% in Daurbalya, 29.41 % in Swedadhikya, 34.14% in Kshudrashvasa, 33.33% in Daurgandhya, 14.28% in Kshudhadhikya and 17.77% in Nidradhikya.

On Day 90, it was observed as, 53.84% in Karya anutsaha, 69.44% in Daurbalya, 64.70 % in Swedadhikya, 65.86% in Kshudrashvasa, 63.63% in Daurgandhya, 42.84% in Kshudhadhikya and 46.67% in Nidradhikya.

In control group marginally less percentage of relief observed comparatively experimental group.

In control group the percentage of relief noted in Karya anutsaha was 18.91% on Day 30, 29.72% on Day 60 and 59.45% on Day 90.

The percentage of relief noted in Daurbalya was 17.94% on Day 30, 35.89% on Day 60 and 58.97% on Day 90.
The percentage of relief noted in Swedadhikya was 19.04 % on Day 30, 26.19 % on Day 60 and 47.61 % on Day 90.
The percentage of relief noted in Kshudrashvasa was 16.66% on Day 30, 27.77% on Day 60 and 58.33% on Day 90.
The percentage of relief noted in Daurgandhya was 16.66% on Day 30, 27.77% on Day 60 and 58.33% on Day 90.
The percentage of relief noted in Kshudhadhikya was 5.17% on Day 30, 17.24% on Day 60 and 31.03% on Day 90.
The percentage of relief noted in Nidradhikya was 0% on Day 30, 6.25% on Day 60 and 29.16% on Day 90.

Effect of Therapy on Symptoms (Subjective Criteria) of Sthaulya Statistically

In Experimental Group, regarding symptom Karya anutsaha, Daurbalya, Swedadhikya, Kshudrashvasa, Daurgandhya, Kshudhadhikya and Nidradhikya p value obtained was <0.0001 which shows extremely significant difference on Day 90 as compare to Day 0.

In Control Group also , regarding symptom Karya anutsaha, Daurbalya, Swedadhikya, Kshudrashvasa, Daurgandhya, Kshudhadhikya and Nidradhikya p value obtained was <0.0001 which shows extremely significant difference on Day 90 as compare to Day 0.

On comparison of both group in symptom of Karya anutsaha, Swedadhikya, Kshudrashvasa, Daurgandhya, Kshudhadhikya, Nidradhikya which was not significant at 5% level of significance as the p value > 0.05 of Experimental and control group, so therefore we can conclude that in these symptoms both intervention are equally effective statistically.

In symptom Daurbalya the p value obtained was < 0.05 which shows that there is difference in Experiment group and control group statistically.

Effect of Therapy on Parameters (Objective Criteria) of Sthaulya Statistically

In Experimental Group, for objective criteria like weight, BMI and waist Hip ratio p value obtained was <0.0001 which was statistically considerably extremely significant (p<0.001) on Day 30, 60 and 90 as compare to Day 0.

In Control Group, for Objective Criteria like Weight BMI(Body Mass Index) and waist Hip ratio p value obtained was <0.0001 which was statistically considerably extremely significant (p<0.001) on Day 30, 60 and 90 as compare to Day 0.

On comparison of both group in parameter, Weight ,BMI(Body Mass Index) and waist Hip ratio the p value obtained is <0.001 which can be considered as extremely significant statistically.

So it can be concluded that there is difference in both group statistically. Experimental group intervention is better than Control group intervention.

Percentage of Relief in Each Patient of Sthaulya

Overall it was observed that Percentage of Relief in Each Patient of 60 Patients of Sthaulya in experimental group was 59.99 while 48.89 % in Control group. On an average in both group 54.44 % relief got in each patients of Sthaulya.

CONCLUSION

Sthaulya is a worrying disease for patients as well as normal individual because it leads to some non communicable disease like Hypertension, cardiovascular diseases, diabetes etc.

After the scientific analysis of the clinical observations obtained in the present study the following concluding points can be drawn.

Vata- Khapha dominant Tridosha and Rasa, Rakta, Mansa & Meda are involved in the Samprapti of Sthaulya.

All the patients were found to indulge in single or many etiological factors causative for samprapti of sthaulya as per Ayurveda.

Effect of intervention on Subjective parameters

In Experimental Group as well as in Control Group

regarding symptoms of medovriddhi results shows extremely significant difference on Day 90 as compare to Day 0.

However in Experimental group i.e with Anulom Vilom Pranayam in symptom Daurbalya shows that, there is difference in Experiment group and control group statistically. For rest of symptoms both interventions were equally effective in management of Sthaulya.

Effect of intervention on Parameters (Objective Criteria)
In Experimental and Control Group, for Objective Criteria like Weight, BMI (Body Mass Index) and waist Hip ratio was statistically considerably extremely significant on Day 30, 60 and 90 as compare to Day 0.
However Experimental Group intervention was better than control group.

Percentage of Relief in Each Patient of Sthaulya
Overall it was observed that Percentage of Relief in experimental group was 59.99 while 48.89 % in Control group.

Final conclusion
Overall it found that Anulom Vilom Pranayam has role in the management of Sthaulya or in reducing weight. It is also useful in maintaining healthy life style with holistic approach.

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