

Results of Various Projects with ION MAGNETUM THERAPY

1.

**EFFECTS OF ION MAGNETUM THERAPY (IMT)
ON BLOOD SUGAR LEVEL AND CARDIO-
RESPIRATORY FITNESS IN PATIENTS WITH
TYPE 2 DIABETES – A PILOT STUDY**

- AIM:

To compare the effectiveness of ION Magnum Therapy and resistive exercise therapy on patients with Type 2 diabetes

- OBJECTIVES:

1. To check the effects of resistive exercises on body mass index, blood sugar levels by fasting sugar and post prandial and on cardiorespiratory fitness by 6 Min Walk Test
2. To check the effect of ION Magnum Therapy on body mass index, blood sugar levels by fasting sugar and post prandial and on cardiorespiratory fitness by 6 Min Walk Test
3. To compare both treatment on body mass index, blood sugar levels by fasting sugar and post prandial and on cardiorespiratory fitness by 6 Min Walk Test

- **MATERIALS AND METHODOLOGY**

- STUDY DESIGN : Comparative experimental Study
- STUDY SETTING : Dr. D. Y Patil Physiotherapy College, Pimpri, Pune.
- SAMPLE SIZE : 20

- **OUTCOME MEASURES:**

- 1) Blood sugar level- Fasting and PP
- 2) Cardiorespiratory fitness- 6 Min Walk Test
- 3) Body mass index- (wt/ht²)

- **INCLUSION CRITERIA:**

- 1) Patients with Type 2 Diabetes
 - Fasting (120-250 mg/dl)
 - After meal (180- 300 mg/dl)
- 2) Age group 30-80 years

- **EXCLUSION CRITERIA:**

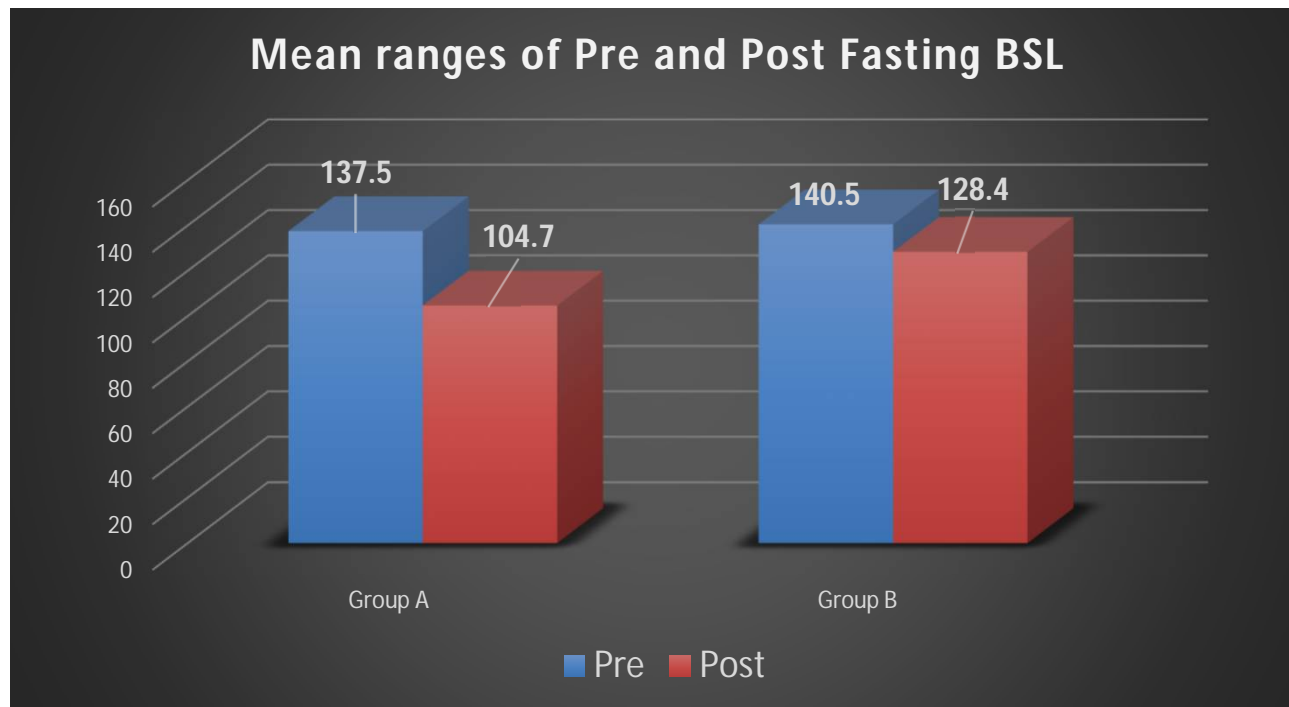
- 1) Patients with Type 1 or gestational diabetes
- 2) Age group more than 80 years
- 3) Musculoskeletal problems like recent fractures, osteoarthritis
- 4) Skin hypersensitivity.
- 5) Skin allergy or open wound like diabetic foot, dermatitis.

- The project was conducted after the approval of ethical committee of Dr D. Y. Patil College of Physiotherapy. The individuals were informed in detail about the study and the procedure. Informed consent was obtained from the recruited individuals participating in the study.
- The subjects with type 2 diabetes were selected from the DPU campus and OPD. 20 samples which were willing to be the part of this were selected. These 20 subjects were divided into 2 groups of 10 each as Group A and Group B.

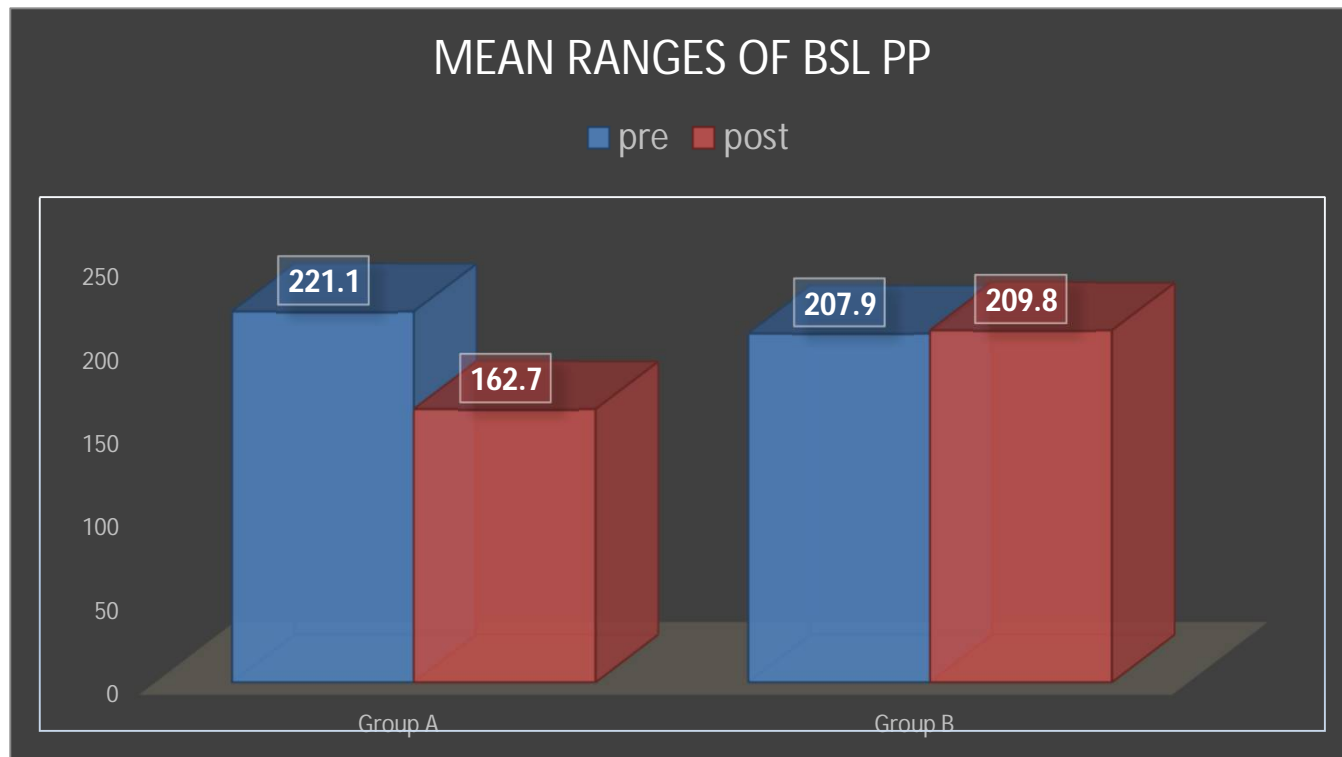
- Group A (IMT + Exercises)
- 40mins IMT + 20mins exs
- 6 weeks

- Group B (Only Exercises)
- 20 mins exercises
- 6 weeks

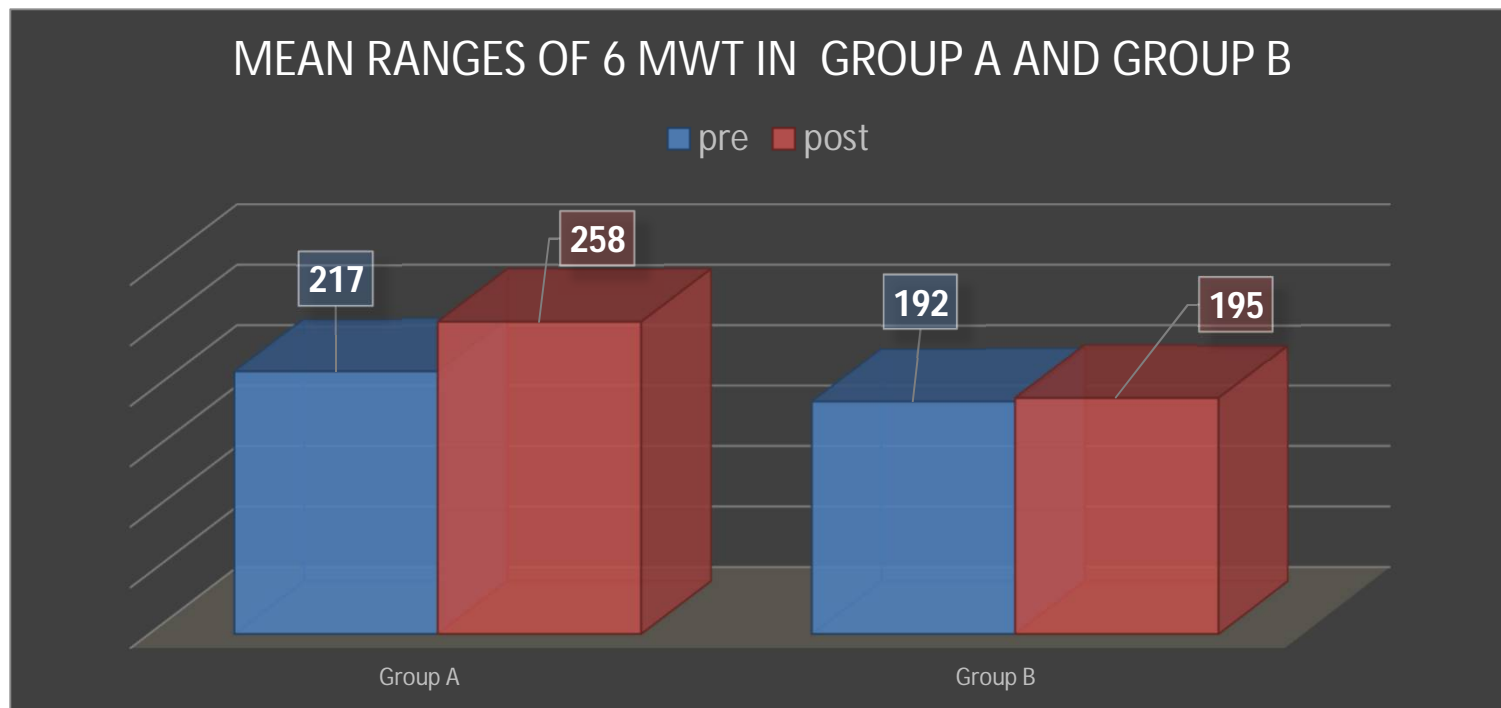
Fasting Blood Sugar level	Pre	Post	Difference	T Value P value
Group A	137.5 ± 87.9	104.7 ± 67.7	46.3	T = 2.903 P = 0.018 (S)
Group B	104.7 ± 75.42	128 ± 75.42	12.7	T = 2.407 P = 0.039 (S)
T Value P value			T = 2.733 P = 0.014 (S)	



Post prandial Blood Sugar level	Pre	Post	Difference	T Value P value
Group A	221.1 ± 57.96	162.7 ± 55.13	58.4	T = 3.783 P = 0.004 (S)
Group B	207.9 ± 49.3	209.8 ± 52.19	-1.09	T = -0.433 P = 0.683 (NS)
T Value P value			T= 3.750 P= 0.001 (S)	



	Pre	Post	Difference	T Value P value
Group A	217 ± 40.29	258 ± 52.03	41	T = -5.562 P = 0.001 (S)
Group B	192 ± 48.03	195 ± 54.42	3	T = -1.152 P = 0.219 (NS)
T Value P value			T= 4.861 P= 0.001 (S)	



- Conclusion :- Ion Magnetum Therapy with exercises is more effective than only exercises on reducing blood sugar and improving cardio-respiratory endurance in patients with Diabetes Mellitus Type II.

2.

**EFFECT OF ION MAGNETUM POWER ON
PATIENT WITH TYPE 2 DIABETES MELLITUS**

AIM & OBJECTIVES

- **AIM**

To find the effect of Ion Magnetum Therapy on HbA₁C level & waist hip ratio in patients with type 2 diabetes mellitus.

- **OBJECTIVES**

- To assess the effect of ION Magnetum therapy along with conventional exercises on HbA₁C level & waist hip ratio in patients with type 2 diabetes.
- To assess the effect of conventional exercises alone on HbA₁C level & waist hip ratio in patients with type 2 diabetes.
- To compare the effect of ion magnetum therapy & conventional therapy on HbA₁C level & waist hip ratio in patients with type 2 diabetes.

- **MATERIALS & METHODOLOGY**

- **STUDY DESIGN** : Experimental study- Pilot study
- **STUDY SETTING** : Dr. D. Y. Patil College of physiotherapy , Pune
- **SAMPLE SIZE** : 20

- **INCLUSION CRITERIA** :

- Patients with type 2 diabetes mellitus diagnosed by physician.
- Age group 40-65 years.
- Patient with diabetes mellitus since 2 years and more.

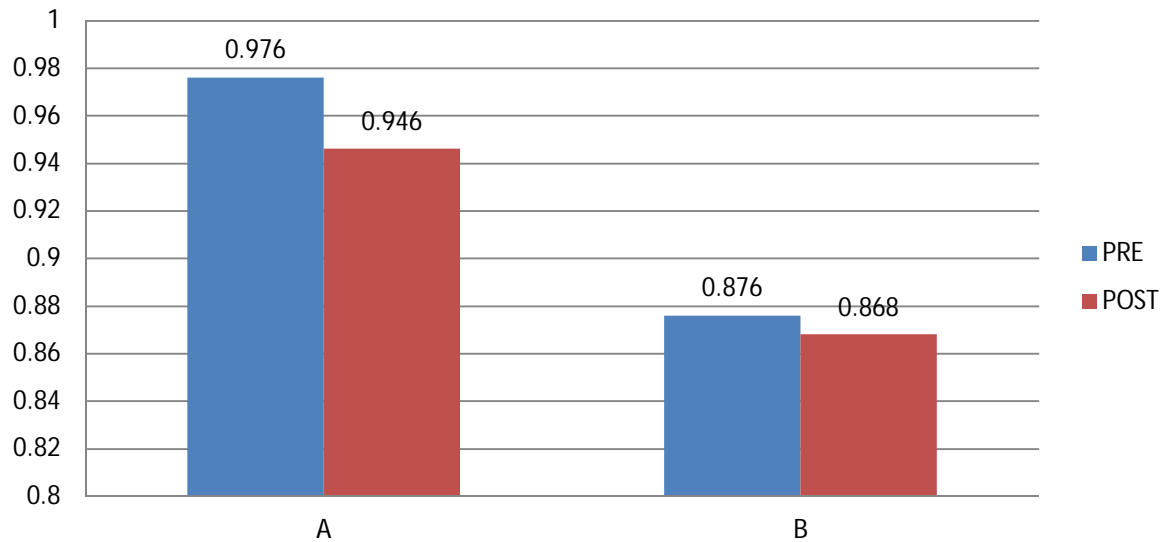
- **EXCLUSION CRITERIA** :

- Patients with uncontrolled diabetes mellitus .i.e. FBS level >250,
- Post prandial BS level >300.
- Patients with neurological conditions like stroke, spinal cord injuries, Parkinson disease.
- Patient who are unable to follow commands like in cognitive impairment conditions like dementia, Alzheimer's disease.
- Patients with pancreatic cancer, cirrhotic liver.
- Patients with gestational diabetes, pregnancy.

- The project was conducted after the approval of ethical committee of Dr. D.Y.Patil College of Physiotherapy.
- The individuals were informed in detail about study & the procedure. Informed consent was obtained from the recruited individuals participating in the study.
- These 20 subjects were divided into 2 groups of 10 each as group A & group B. Subjects are pre-assessed with demographic data, HbA1C level, & weight, waist hip ratio.
- Group A was given ion magnetum therapy for 40 min & exercises for 20 min for 6 weeks, twice per week.
- Group B was given only exercises for 20 minutes which included 10 minutes of treadmill walking and 10 minutes of resistive exercises with 1 kg dumbbell for shoulder, arm and wrist same as group A.

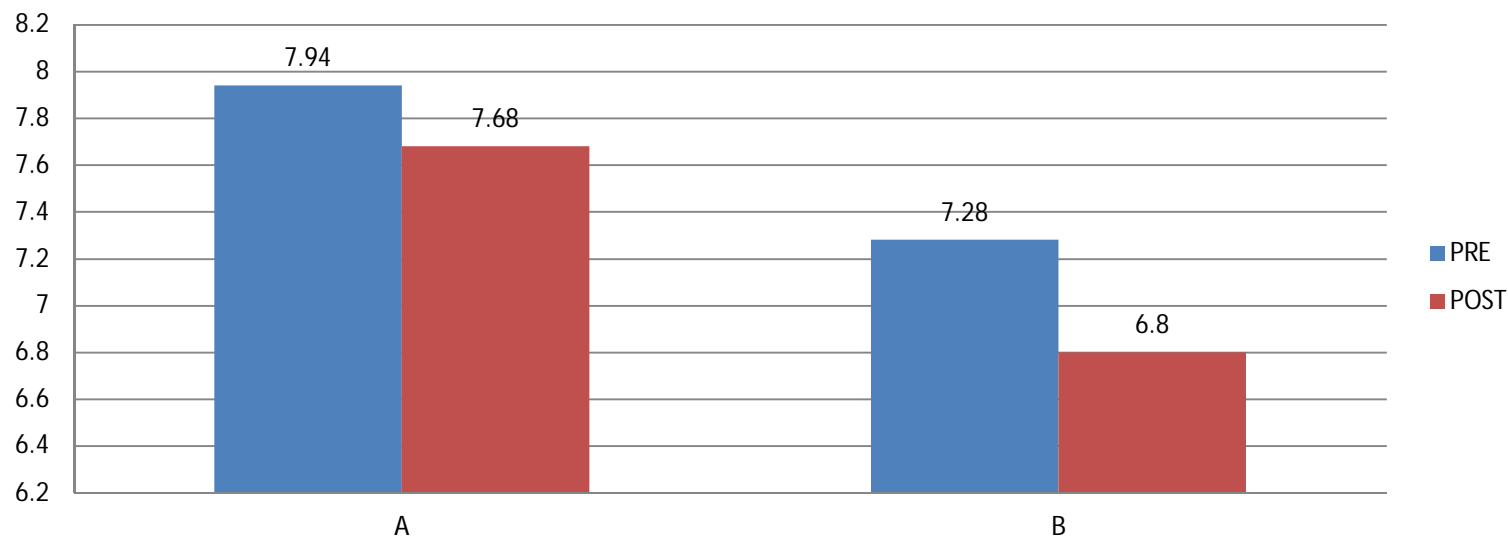
Waist-hip ratio mean		Mean \pm SD		P value
Group A (n=10)	Pre	0.976 \pm 0.19	W=2.814 (Wilcoxon test)	0.005 (significant)
	Post	0.946 \pm 0.17		
Group B (n=10)	Pre	0.876 \pm 0.14	T=0.921 (Paired-t test)	0.381 (non-significant)
	Post	0.868 \pm 0.15		
Mean Difference mean	Group A	0.63 \pm 0.27	T=3.025 (Mann-Whitney test)	0.001 (significant)
	Group B	0.01 \pm 0		

WAIST HIP RATIO MEAN



HbA1c mean		Mean± SD		P value
Group A (n=10)	Pre	7.94± 1.56	W=2.783 (Wilcoxon test)	0.005 (significant)
	Post	7.28± 1.43		
Group B (n=10)	Pre	7.68± 1.34	T=4.105 (Paired-t test)	0.003 (significant)
	Post	6.8± 1.04		
Mean Difference mean	Group A	0.66± 0.28	T=492 (Mann-Whitney test)	0.623 (non-significant)
	Group B	0.88± 0.67		

HbA1c LEVEL MEAN



- **CONCLUSION**

- This study concludes that ION Magnetum therapy is more effective in reducing waist hip ratio & improving HbA1C level in patients with type 2 diabetes mellitus. ION Magnetum therapy can be used as adjuvant therapy along with exercises for best results.

3.

EFFECTS OF ION MAGNETUM THERAPY ON PAIN AND
RANGE OF MOTION IN PATIENT HAVING
MECHANICAL LOW BACK PAIN :- A PILOT STUDY

SUBMITTED BY:- AISHWARYA GUNDYE

GUIDED BY :- Dr. MANISHA RATHI, Ph.D

AIM: To study the effect of Ion Magnetum Therapy on Pain And Range Of Motion In patients with mechanical low back pain.

OBJECTIVES: The objectives for the project are:

- To analyze the effect of ion magnum therapy on the pain levels and lumbar range of motion in patients with the help of NPRS in mechanical low back pain.
- To analyze the effect of conventional Therapy on the pain levels and lumbar range of motion in patients with the help of NPRS in mechanical low back pain
- To compare the effects of Ion Magnetum Therapy with conventional therapy.

- **MATERIALS AND METHODOLOGY**

- **STUDY DESIGN** : Experimental study- Pilot
- **STUDY SETTING** : Dr. D. Y. Patil College of physiotherapy, Pune
- **SAMPLE SIZE** : 20

- **OUTCOME MEASURES:**

- NPRS
- Lumbar ranges – Flexion, Extension, Side flexion to Right side and Left side

- **INCLUSION CRITERIA:**

- Low Back ache Chronic in nature
- Non-specific (no known cause)
- Age group 19-50 years

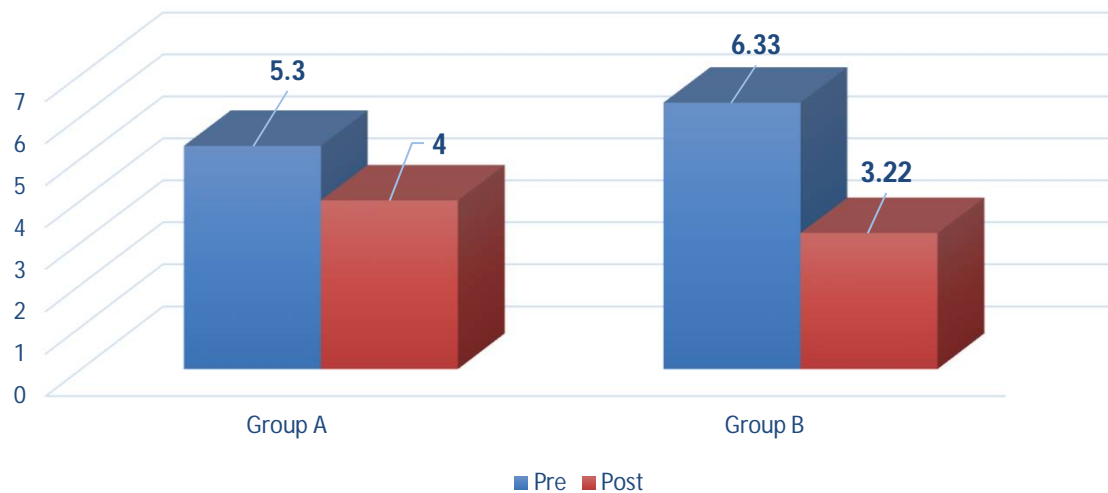
- **EXCLUSION CRITERIA:**

- PIVD
- Fracture of spine recent or unhealed
- Pregnancy
- Tumours
- skin allergy
- congenital deformity of spine eg.scoliosis
- Ankylosing spondylitis, Rheumatoid arthritis

- The project was conducted after the approval of ethical committee of Dr. D.Y.Patil College of Physiotherapy.
- The individuals were informed in detail about study & the procedure. Informed consent was obtained from the recruited individuals participating in the study.
- These 20 subjects were divided into 2 groups of 10 each as group A & group B. Subjects are pre-assessed with demographic data, Pain and Range of Lumbar spine
- Group A was given Hot packs (10 min.), Structured exercises for 20 min for 6 weeks, twice a week.
- Group B was given ion magnetum therapy for 40 min and Structured exercises for 20 minutes for 6 weeks, twice a week

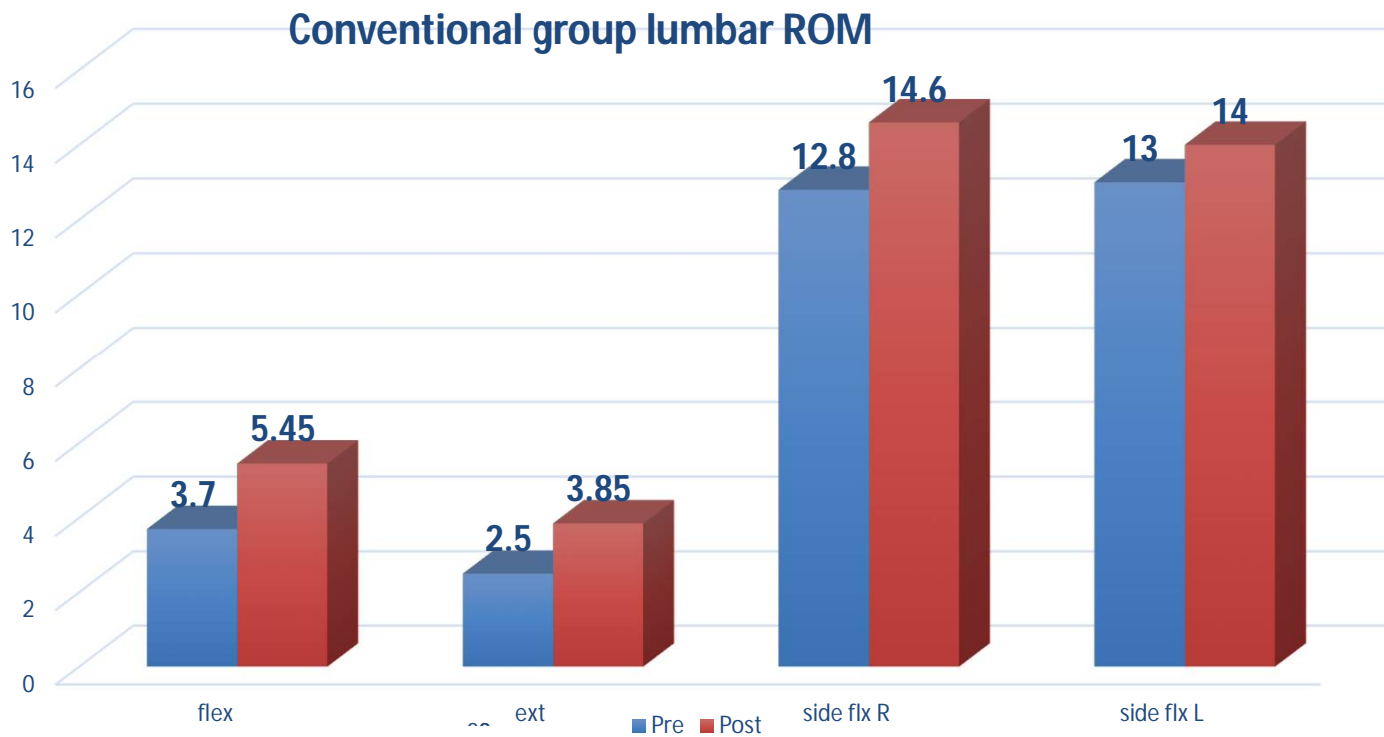
NPRS	Pre	Post	Mean difference	T value	P value
Group A	5.3±2.16	4±1.88	1.3±0.948	4.33	< 0.001, significant
Group B	6.33±0.86	3.22±1.09	3.11±1.05	8.85	< 0.001, significant

Effect of IMT on Pain using NPRS



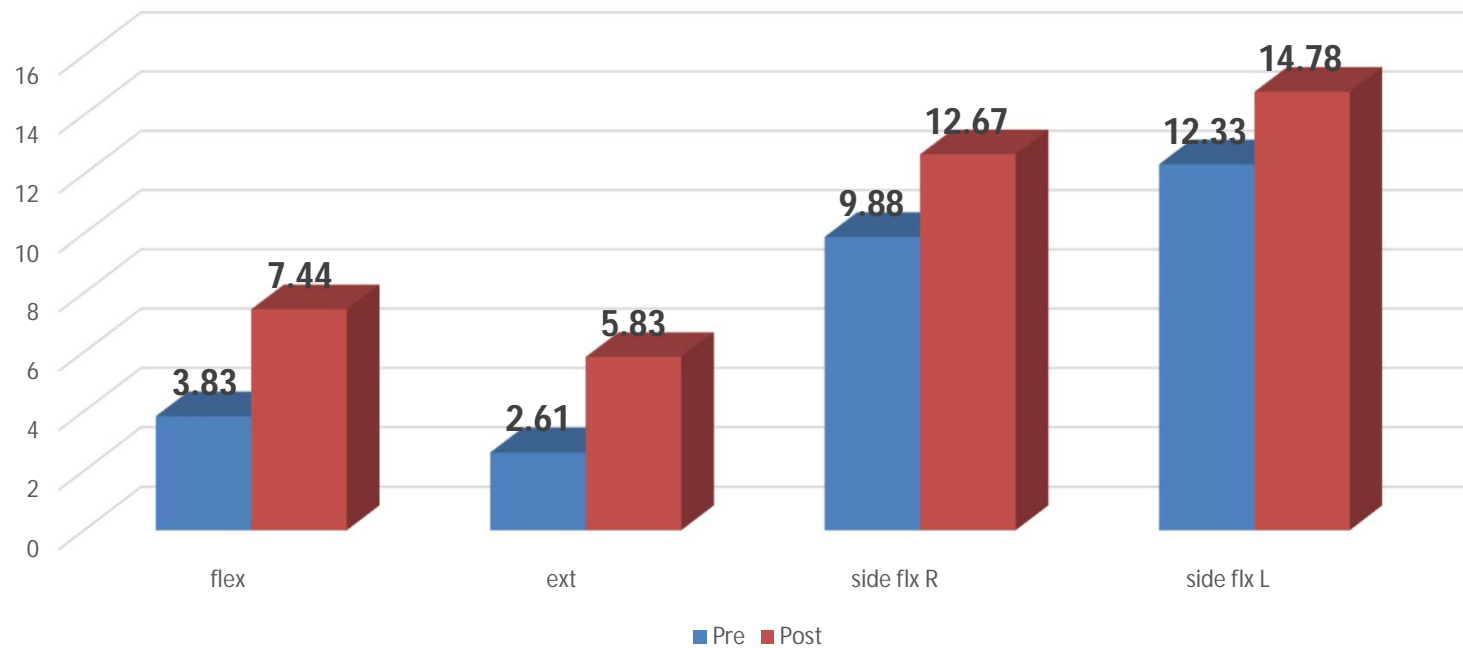
When both groups were compared, we found that the mean difference of pre and post treatment between two groups showed statistically significant difference as $p < 0.005$, group B showed more improvement than group A

Group A	Pre	Post	Mean difference	T value	P value
Flexion	3.7±1.41	5.45±2.00	-1.75±0.92	-6.012	< 0.001, S
Extension	2.5±1.17	3.85±1.7	-1.35±0.88	-4.832	< 0.001, S
Side flexion Right	13.4±2.59	14.5±2.36	-1.1±0.87	-3.973	< 0.005, S
Side flexion left	13±5.61	14±5.51	-1±1.33	-2.372	< 0.005, S



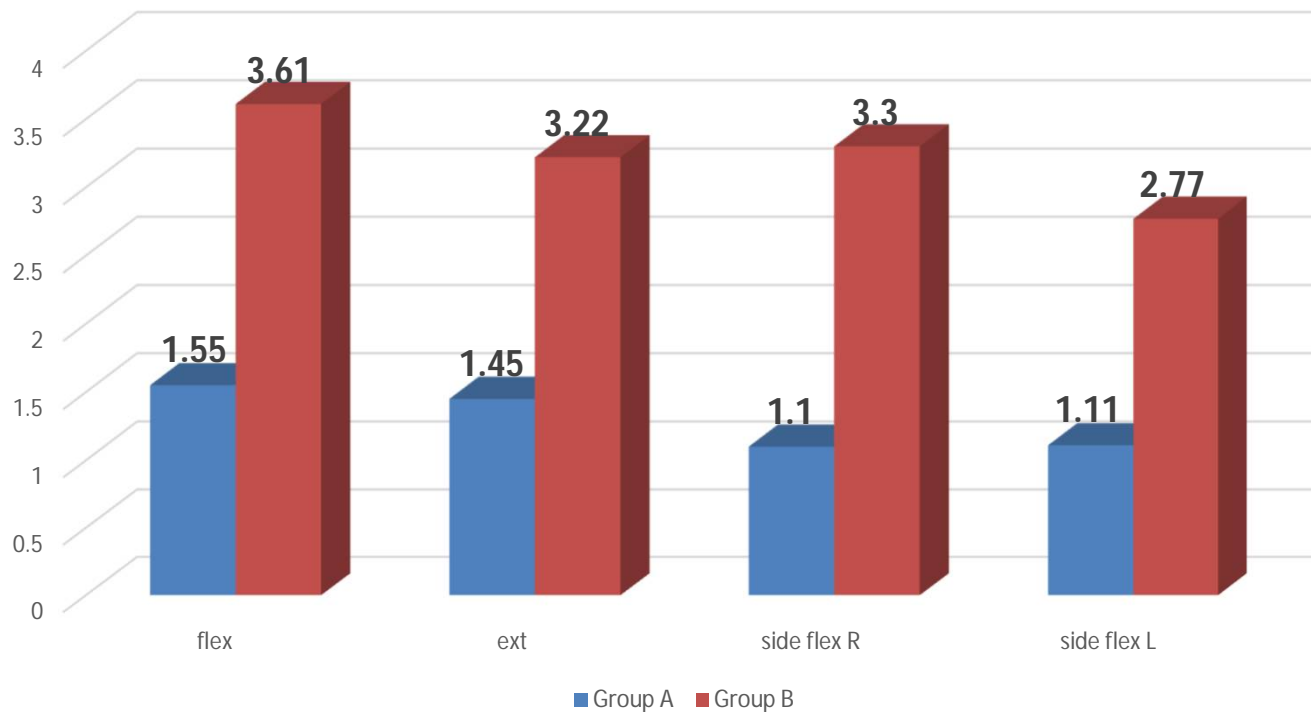
Group B	Pre	Post	Mean difference	T value	P value
Flexion	3.83±0.79	7.44±1.33	-3.61±1.40	-7.687	< 0.001, S
Extension	2.61±0.82	5.83±1.06	-3.22±1.14	-8.416	< 0.001, S
Side flexion Right	11±3	14.67±2.44	-3.66±1.73	-6.35	< 0.001, S
Side flexion left	12.33±2.17	14.78±2.81	-2.44±1.94	-3.773	< 0.005, S

IMT group lumbar ROM



DIFFERENCE	GROUP A	GROUP B	MEAN DIFFERENCE	T VALUE	P VALUE
FLEXION	1.55±0.68	3.61±1.40	-2.06	--4.124	< 0.001 (S)
EXTENSION	1.45±0.59	3.22±1.14	--1.77	-4.284	< 0.001 (S)
SIDE FLEX R	1.1±0.87	3.3±2.00	-2.2	-3.183	< 0.005 (S)
SIDE FLEX L	1.11±1.36	2.77±2.04	-1.66	-2.032	< 0.005 (S)

Difference of conventional v/s IMT



CONCLUSION

The study has proved that ION MAGNETUM THERAPY with structured exercises shows better results in lumbar ranges of motion and reduction of pain intensity than intervention of conventional methods of treatment alone.

4.

**EFFECT OF ION MAGNETUM THERAPY IN
PATIENTS WITH NON-SPECIFIC LOW BACK
PAIN-A PILOT STUDY**

AIM AND OBJECTIVES

AIM: To study the effect of Ion Magnetum Therapy in Non-Specific low back pain.

OBJECTIVES: The objectives for the project are:

- To assess the effect of Ion Magnetum Therapy and conventional therapy on muscle strength and function using pressure biofeedback and Oswestry disability index.
- To assess the effect of conventional therapy on muscle strength and function using pressure biofeedback and Oswestry disability index.
- To compare the effects of Ion Magnetum Therapy and conventional therapy on muscle strength and function using pressure biofeedback and Oswestry disability index.

- **MATERIALS AND METHODOLOGY**

- **STUDY DESIGN** : Experimental-comparative study

- **STUDY SETTING** : Dr. D. Y. Patil College of Physiotherapy , Pune

- **SAMPLE SIZE** : 20

- **INCLUSION CRITERIA:**

- Chronic Low back pain

- Non-specific (no cause known)

- Age group 18-60 years

- **OUTCOME MEASURES**

- Oswestry Functional Index

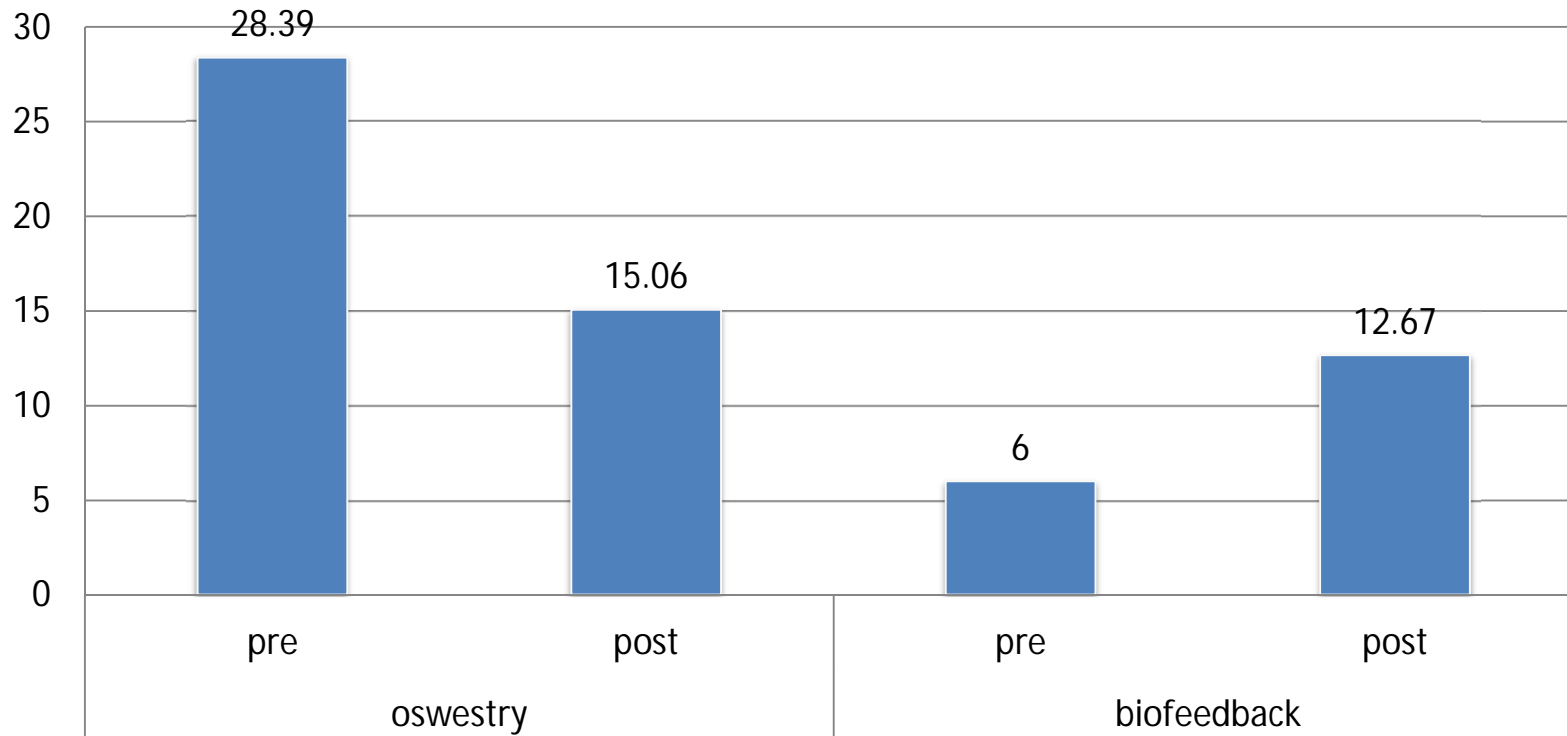
- Pressure biofeedback

- Ethical approval was obtained from institutional ethical committee. An initial screening and subject matching with inclusion and exclusion criteria were included in the study. 20 subjects were included and a written consent was taken. Two groups were formed and subjects were divided in two groups by using chit method:
- Group A received Ion Magnetum Therapy for 40 minutes + structured exercises for 20 minutes + hot pack for 10 minutes.
- Time: 40 minutes
- Group B received Structured exercises for 20 minutes + hot pack for 10 minutes
- Exercises included Straight leg raise, Knee to chest, Prone on elbows, Pelvic tilt, Cat and Camel, Tail walk, Lumbar rotation
- Intervention was given for 6 weeks, Twice a week

Interpretation:

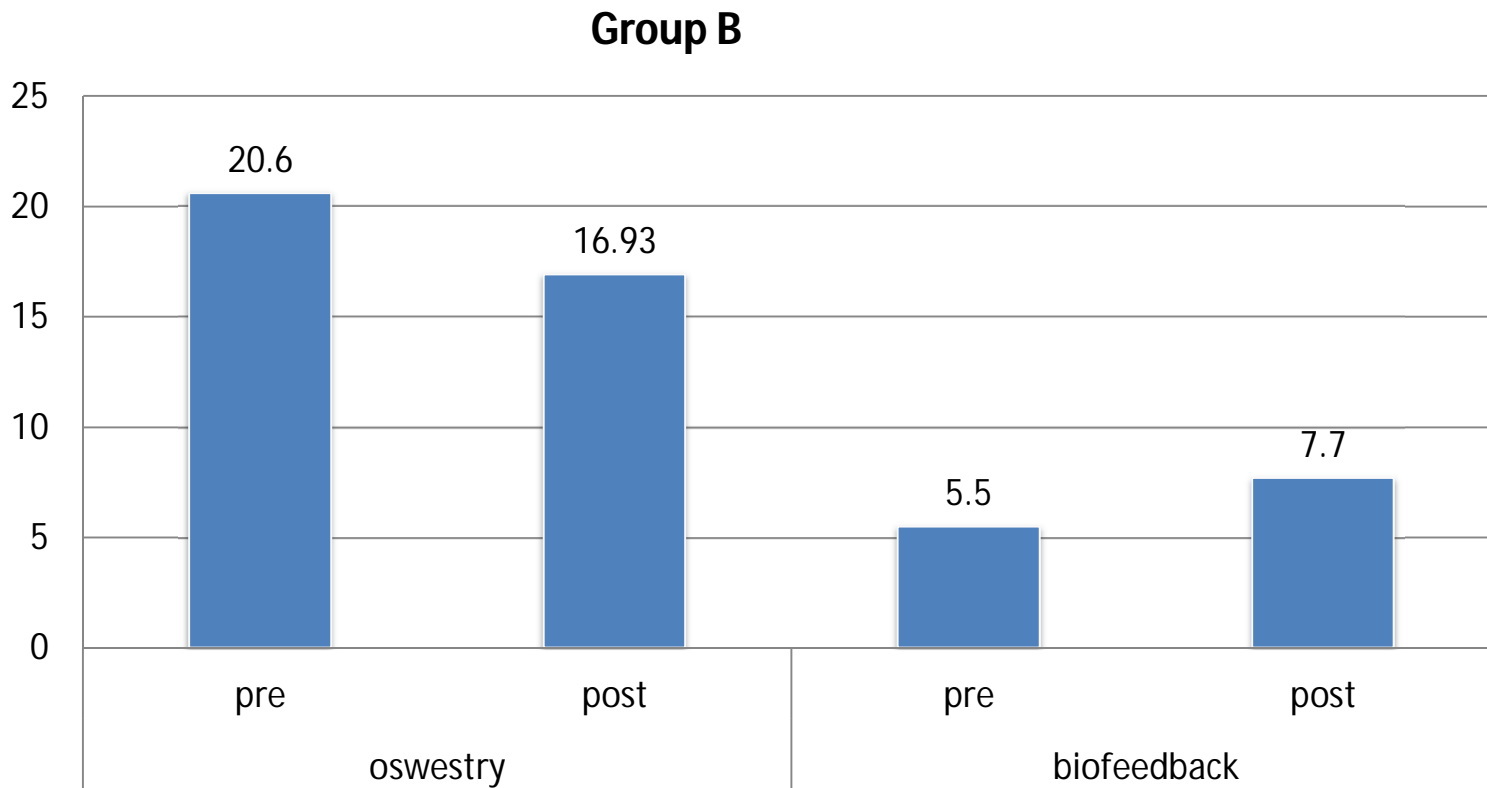
This graph represents the values of the disability index and muscle power in the group A patients (the experimental group). After applying the paired t-test, the mean of the disability index has shifted from 28.39% to 15.06% which shows an improvement of 13.33%. The mean of the muscle power has shifted from 6mmHg to 12.67mmHg which shows an improvement of 6.67mmHg.

Group A



Interpretation:

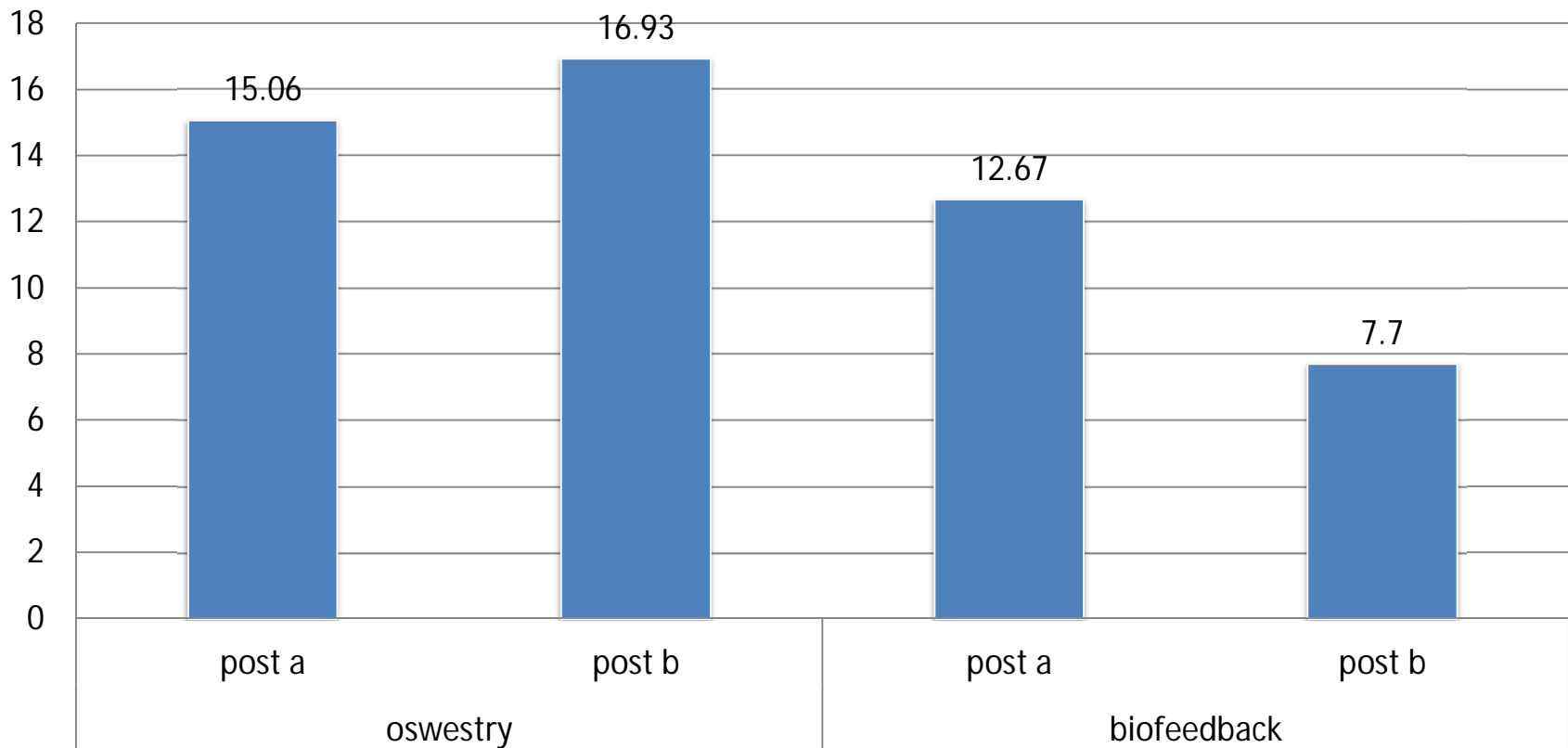
This graph represents the values of the disability index and the muscle power pre and post intervention. After applying the paired t-test, the mean of the disability index shifted from 20.6 to 16.93 which is the difference of 3.67. The mean of the muscle power shifts from 5.5 to 7.7 which is the difference of 2.2. Both of these values were taken post 12 sessions of treatment



Interpretation:

This graph represents the values of the disability index and the muscle power post readings of Group A and post readings of Group B. After applying the unpaired t-test, the post readings of Oswestry disability index are 15.06 for group A and 16.93 for group B. The mean of the muscle strength is 12.67 for group A and 7.7 for group B. Both of these values were taken post 12 sessions of treatment.

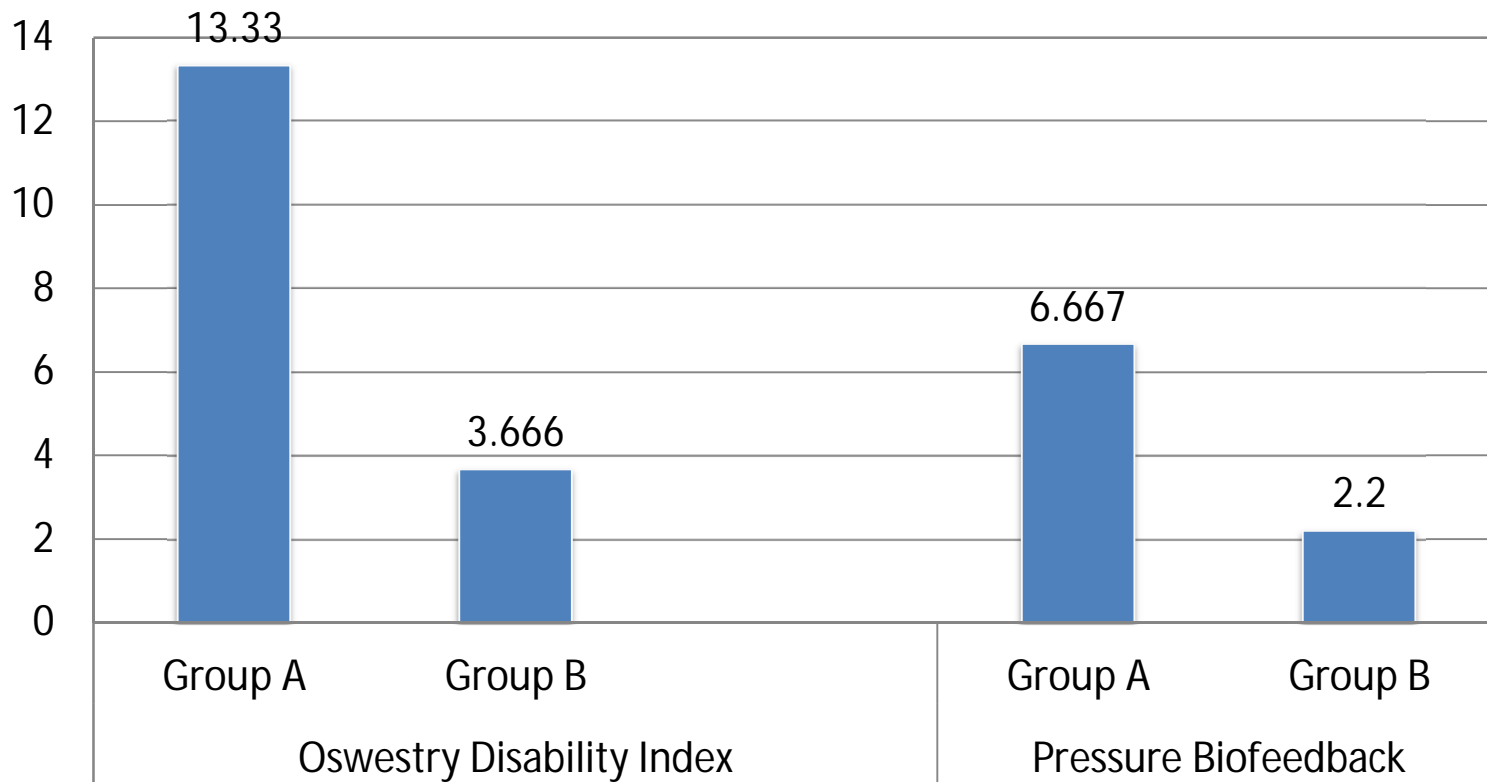
Group A vs Group B



Interpretation:

The above graph shows the difference between the Group A and Group B readings of Oswestry disability index and pressure biofeedback. After applying the unpaired t-test, for Oswestry disability index the difference is 13.33 in group A and 3.666 in group B. For the pressure biofeedback, the difference is 6.667 in group A and 2.2 in group B. Both the readings are highly significant ($p < 0.01$).

Group A (difference) vs Group B (difference)



- **CONCLUSION**

- The study concludes that the improvement in Values of pressure biofeedback and Oswestry disability index was seen in both Group A and Group B, but the results more significant in Group A as compared to Group B.

5.

**EFFECT OF ION MAGNUM THERAPY ON BODY
CIRCUMFERENCE AND BODY FAT
PERCENTAGE IN OBESE INDIVIDUALS :- A
PILOT STUDY**

- **AIM:** To compare the effect of Ion Magnum therapy with conventional therapy versus conventional therapy alone in obese individuals.
- **OBJECTIVES:**
- To find effect of Ion Magnum therapy with conventional therapy on body circumference and body fat percentage in obese individuals.
- To find effect of conventional therapy alone on body circumference and body fat percentage in obese individuals.
- To compare the effects of Ion Magnum therapy with conventional therapy and conventional therapy alone on body circumference and body fat percentage in obese individuals.

MATERIALS & METHODOLOGY

STUDY DESIGN : comparative study
STUDY SETTING : Dr. D Y Patil College of Physiotherapy Pune
SAMPLE SIZE : 20

INCLUSION CRITERIA:

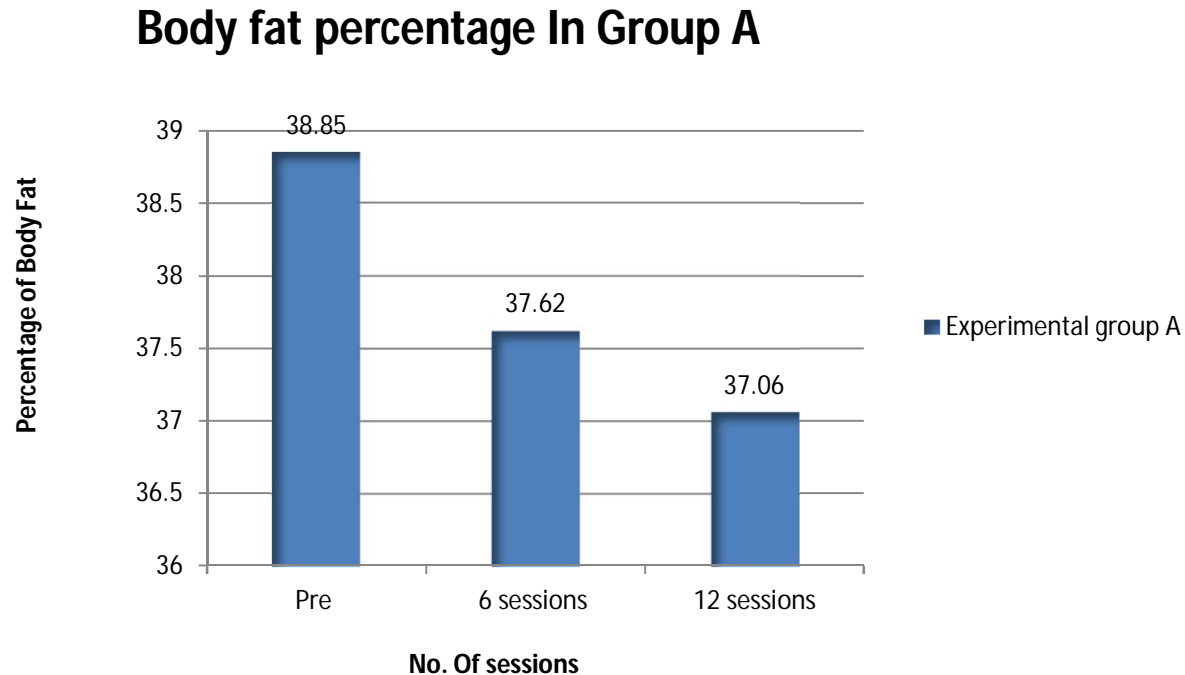
Age group: 20-40 years,
Gender: both male and female
Subjects willing to participate

EXCLUSION CRITERIA:

Recent injuries or open wounds
Acute Neurological conditions
Acute Cardiovascular complications
Pregnant females
Subjects undergoing other therapeutic exercise/ yoga/ aerobic training.

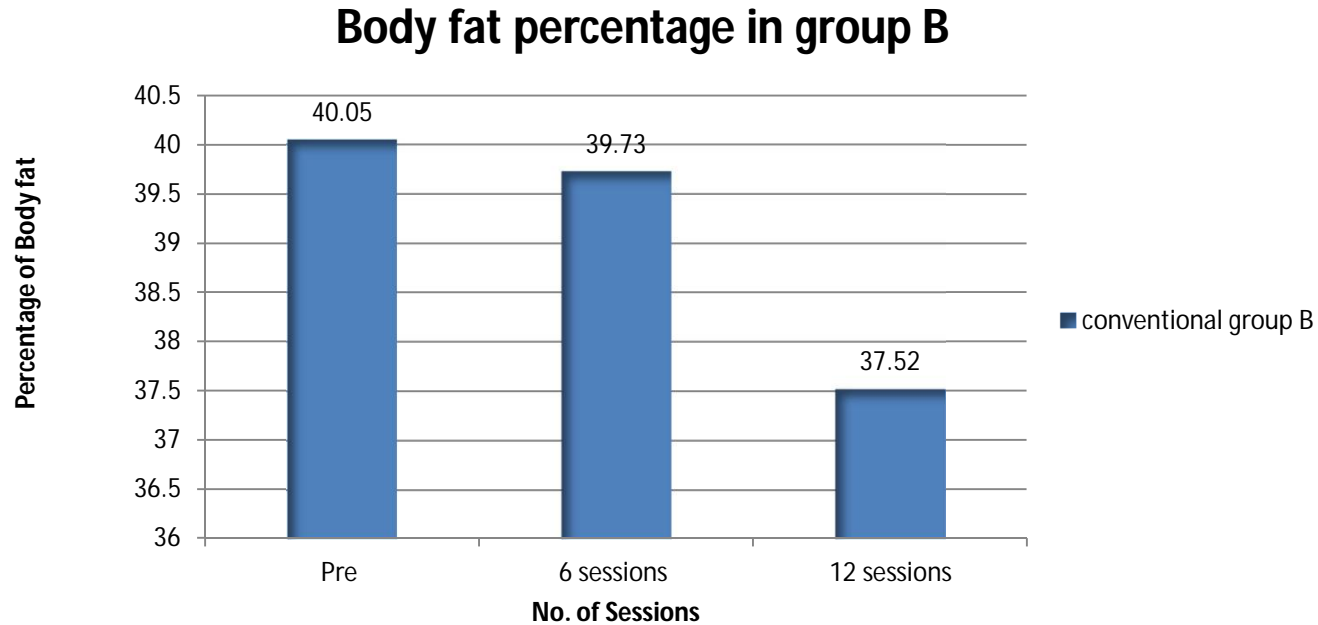
- The project was conducted after the approval of ethical committee of Dr. D.Y.Patil College of Physiotherapy.
- The individuals were informed in detail about study & the procedure. Informed consent was obtained from the recruited individuals participating in the study.
- These 20 subjects were divided into 2 groups of 10 each as group A & group B. Subjects are pre-assessed with demographic data, Circumference and Fat percentage
- Group A was given ion magnetum therapy for 40 min and conventional exercises for 20 min for 6 weeks, twice a week.
- Group B was given conventional exercises for 20 minutes for 6 weeks, twice a week

- **GRAPH 3 (a):** Body fat percentage in group A (experimental group)



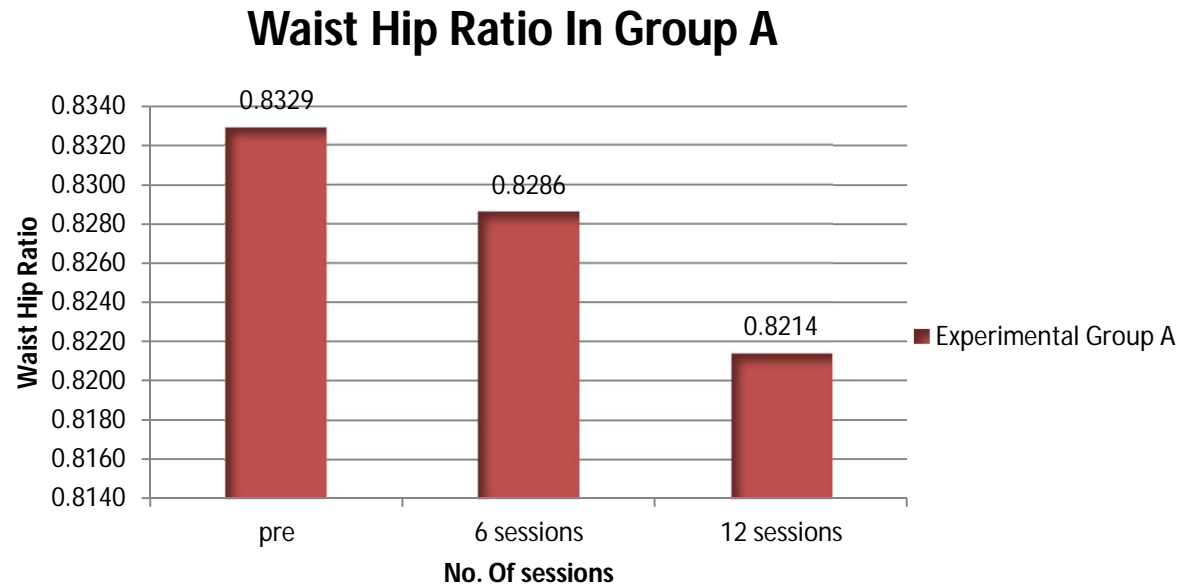
- **Interpretation:**
- This graph shows percentage of body fat calculated in experimental group A pre treatment, post 6 and 12 sessions with average of initial value being 38.85% and 37.62% post 6 session and further reducing up to 37.06% post 12 sessions. There is decrease in body fat percentage throughout the session. The p value being 0.376 shows that the data being statistically not significant

- **GRAPH 3 (b):** Body fat percentage in group B (conventional group)



- **Interpretation:**
- The graph shows percentage of body fat calculated in conventional group B pre treatment, post 6 and 12 sessions with the average of initial value being 40.05% and 39.73% post 6 sessions and further reducing up to 37.52% post 12 sessions. There is decrease in body fat percentage seen post 6 sessions. The p value being <0.05 shows that the data is statistically significant

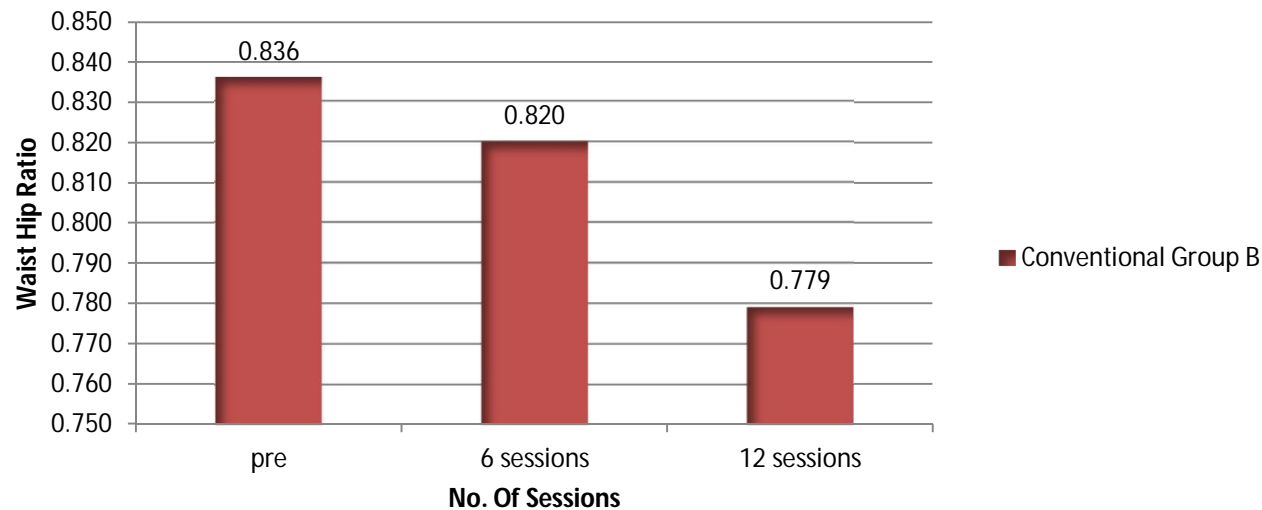
- **GRAPH 4 (a):** Waist Hip Ratio in group A (Experimental group)



- **Interpretation:**
- the graph shows waist hip ratio calculated in experimental group A, pre treatment, post 6 and 12 sessions with the average of initial value being 0.832 and reducing to 0.826 post 6 sessions and further reducing up to 0.8214 post 12 sessions respectively. There is significant decrease in waist hip ratio throughout the treatment. The p value being >0.05 shows that the data is statistically not significant.

- **GRAPH 4(b): Waist hip ratio in group B (conventional group)**

Waist Hip Ratio in group B



- **Interpretation:**
- The graph shows waist hip ratio calculated in conventional group B, pre treatment, post 6 and 12 sessions with the average of initial value being 0.836. The ratio is seen to decrease by 0.82 post 6 sessions and increases further up to 0.779 post 12 sessions. There is increase in ratio throughout the treatment. The p value being 0.046 shows that the data is statistically significant.

- **TABLE 5 (a): Comparison of body fat percentage pre-post 6 sessions between Group A and B**

- t test for assessment of body fat percentage in both groups post 6 sessions are as follows

Group	No. of participants	Mean	Standard deviation	T value P value
A	7	1.23	1.829	1.504 0.154 (NS)
B	10	0.324	0.5158	

- **TABLE 5 (b): Comparison of body fat percentage pre-post 12 sessions between Group A and B**

- Descriptive statistics of body fat percentage in both groups post 12 sessions are as follows

Group	No. of participants	Mean	Standard deviation	T value	P values
A	7	1.803	2.052	0.146	0.884 (NS)
B	10	2.234	1.566		

- **Interpretation:** The mean value was found in group A decreases from (1.23) to (1.803) during the course of 6 and 12 sessions respectively. In group B the mean value decreases from (0.324) to (2.234) post 6 and 12 sessions and the difference being more as compared to group A concluding that the loss in percentage of body fat is seen to be more in conventional group B

- **TABLE 6(a): Comparison of waist hip ratio pre-post 6 sessions between Group A and B**
- Descriptive statistics of waist hip ratio in both groups post 6 sessions are as follows

Groups	No. of participants	Mean	Standard deviation	T value	P value
A	7	0.00285	0.03904	0.850	0.409 (NS)
B	10	0.016	0.02503		

- **TABLE 6 (b): Comparison of waist hip ratio pre-post 12 sessions between Group A and B**
- t test for assessment of waist hip ratio in both groups post 12 sessions are as follows

Groups	No. of participants	Mean	Standard deviation	T value	P value
A	7	0.01	0.04899	2.343	0.019 (S)
B	10	0.057	0.0105		

- **Interpretation:** The mean value was found in group A decreases from (0.0028) to (0.01) during the course of 6 and 12 sessions respectively. In group B the mean value decreases from (0.016) to (0.057) post 6 and 12 sessions. the difference being more in group A concluding that the loss in percentage of body fat is seen to be more in experimental group A.

CONCLUSION

- The body fat percentage in group A decreased during the first 6 sessions and the decrease post 6 session became gradually less while group B showed major decrease post 6 sessions. The waist hip ratio measured for body circumference, in group A and group B both showed decrease post treatment with difference being slightly more in group A.
- This showed that Ion Magnetum therapy can give additional effect in reduction of girth and fat percentage.

6.

THE EFFECT OF ION MAGNUM THERAPY ON
BODY WEIGHT , BMI AND BODY
COMPOSITION IN OBESE POPULATION: A
PILOT STUDY

- **AIM AND OBJECTIVES**

- **AIM:** To compare effect of Ion magnum therapy and conventional therapy with conventional therapy alone in obese individuals .

- **OBJECTIVES:**

- To assess the effect of Ion magnum therapy with conventional therapy in obese adult using body fat analyzer.
- To assess the effect of conventional therapy alone in obese population using body fat analyzer .
- To compare both Ion magnum therapy along with conventional therapy and conventional therapy alone in obese adults using body fat analyzer.

- **MATERIAL AND METHODOLOGY**

- **STUDY DESIGN:** Comparative study .
- **STUDY SETTING:** Dr. D.Y. Patil College Of Physiotherapy (OPD), Pimpri, Pune
- **SAMPLE SIZE:** 20

- **INCLUSION CRITERIA** :
 1. Females .
 2. age: 20 years to 40 years.
 3. BMI above 25

- **EXCLUSION CRITERIA** :

1. Acute cardiovascular complications
2. Acute arthritis
3. Recent injury or trauma
4. neurological condition
5. Subjects performing exercises within 8-10 months.
6. Pregnant women

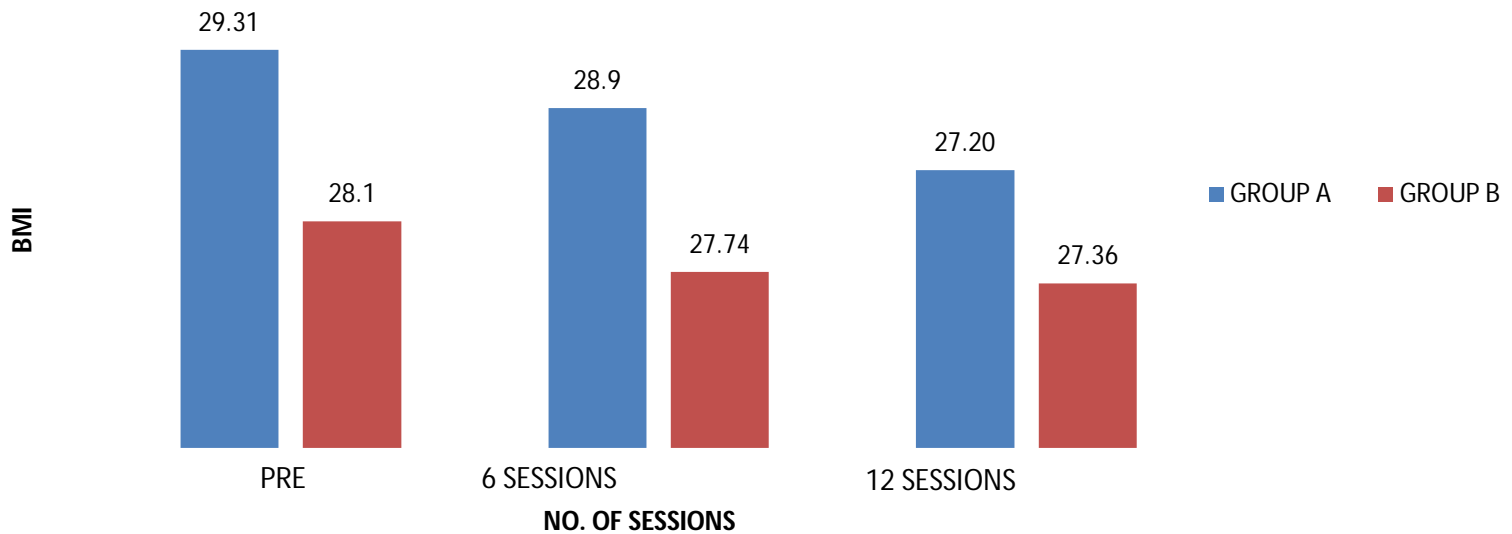
- **OUTCOME MEASURE** :

- **BMI , Total body weight, Body composition** including Body water weight , Body fat mass , muscle mass) Using body fat analyzer

TABLE : Comparison of mean BMI between group A and group B using unpaired t test .

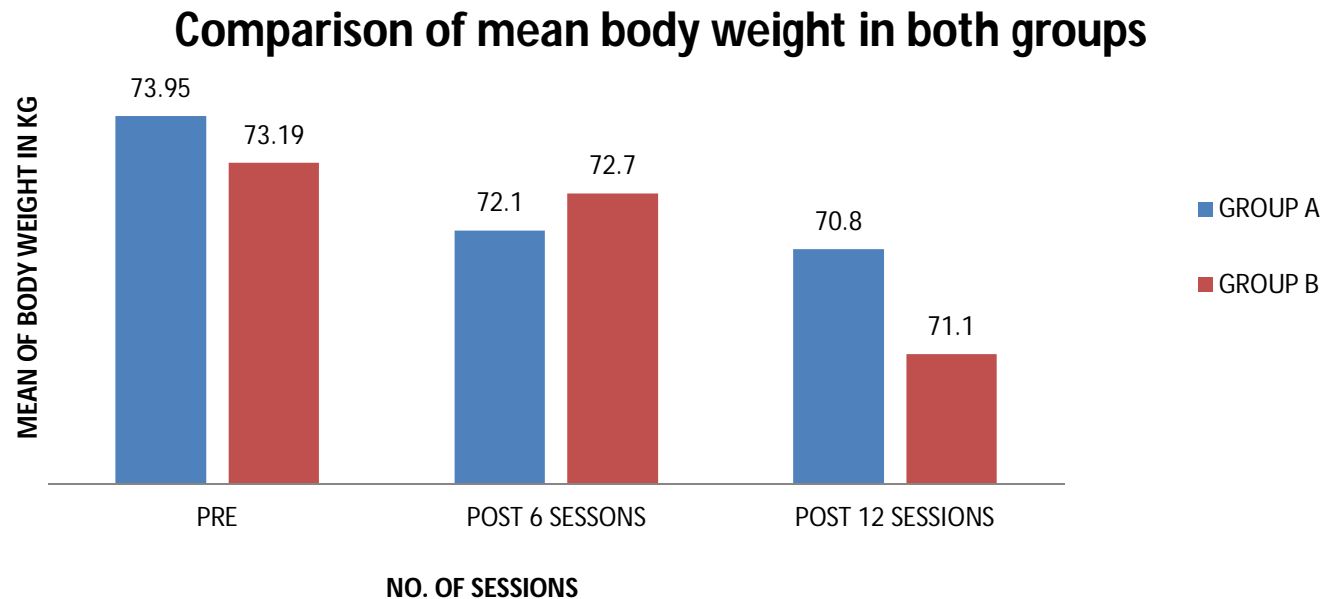
MEAN BMI	PRE	POST 6 SESSIONS	POST 12 SESSIONS	p value
GROUP A	29.31	28.9	28.20	p=0.77 (NS)
GROUP B	28.1	27.74	26.36	p=0.81 (NS)

Comparison of mean BMI in both groups



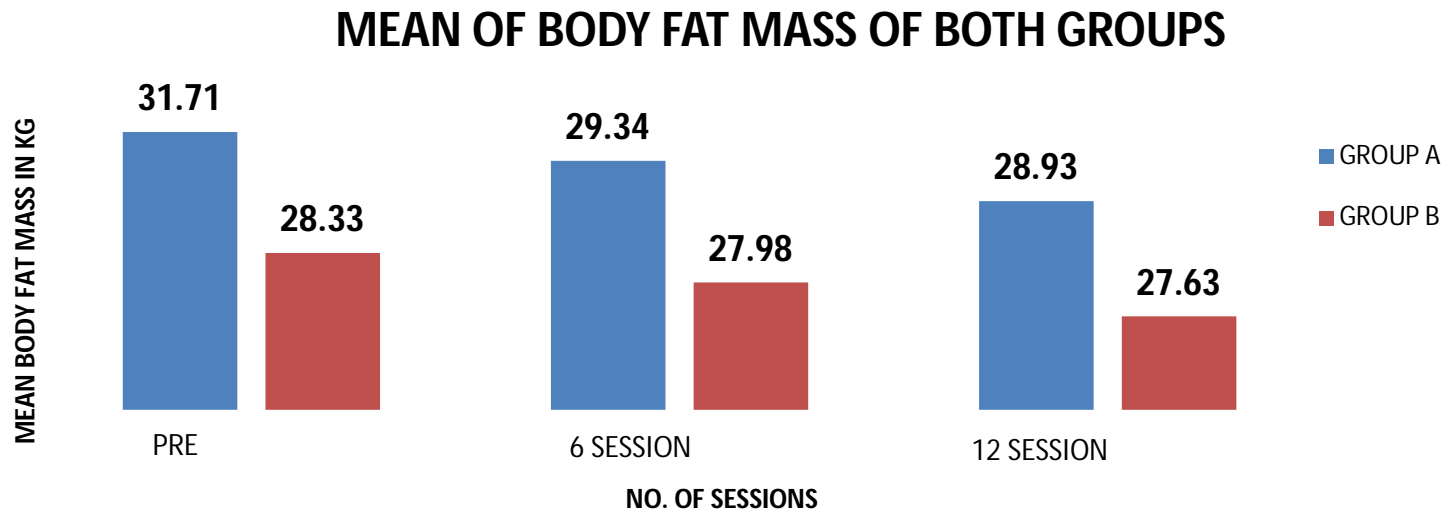
Comparison of mean TOTAL BODY WEIGHT between group A and group B using unpaired t –test

BODY WEIGHT OF BOTH GROUPS	PRE	POST 6 SESSONS	POST 12 SESSIONS	p value
GROUP A	73.95	72.1	71.8	p=0.912 (NS)
GROUP B	73.19	72.7	70.1	p=0.743(NS)



Comparison of mean BODY FAT MASS between group A and group B using unpaired t- test

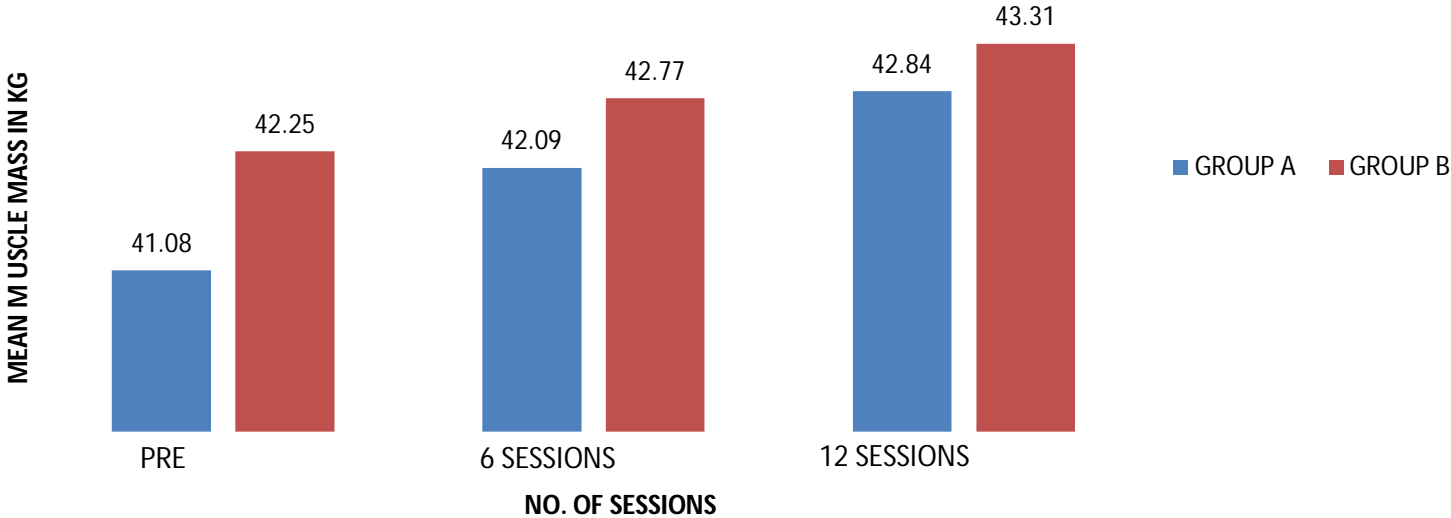
BODY FAT MASS OF BOTH GROUP	pre	post 6 weeks	post 12 weeks	p value
GROUP A	31.71	29.34	28.93	p=0.71 (NS)
GROUP B	28.33	27.98	27.63	p=0.93 (NS)



Comparison of mean TOTAL MUSCLE MASS between group A and group B

MEAN MUSCLE MASS OF BOTH GROUPS	PRE	POST 6 SESSION	POST 12 SESSION	p value
GROUP A	41.08	42.09	42.84	p=0.59 (NS)
GROUP B	42.25	42.77	43.31	p=0.89(NS)

MEAN MUSCLE MASS IN BOTH GROUPS



Conclusion

- This study concludes that BMI , Total body weight , Total body water , body fat mass measured post 12th sessions was decreased in both groups with difference being slightly more in group A but this difference was non significant.

- Other findings reported by the all study participants but not measured/assessed as a study parameters.
 1. Sleep improved
 2. Appetite increased
 3. Overall feeling better
 4. Rejuvenation
 5. Increased frequency of Urination
(May be seasonal effect)

Thank You