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EFFECT OF DIAPHRAGMATIC STIMULATION WITH BREATHING EXERCISES ON CLINICAL OUTCOMES AMONG PATIENTS WITH RESPIRATORY DYSFUNCTION

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Abstract

Asthma and COPD are the most common chronic respiratory diseases among respiratory dysfunction in the world characterized by variable and recurring symptoms, reversible airflow obstruction, and bronchospasm. Symptoms include wheezing, coughing, chest tightness, and shortness of breath. Asthma is clinically classified according to the frequency of symptoms; it has a complex heterogeneity with many clinical phenotypes whose varying expression depends on interplay between numerous environmental factors along with many different susceptibility genes. In COPD lungs cab be damaged due to phlegm with symptoms cough with phlegm, difficult breathing and tiredness. The aim of conducting this research is to find out the effectiveness of diaphragmetic stimulation with breathing exercises on clinical outcomes among patients with respiratory dysfunction. We selected 30 patients with respiratory dysfunction due to asthma and COPD. The participants were selected on the basis of inclusion criteria. Informed consent was taken before the start of exercises. Pulse oximeter was used to assess oxygen saturation values and respiratory rate, MRC dyspnea scale was used to find out the grade of breathlessness and Spirometer was used to find the values of spirometry variables like FVC, FEV1, PEF, FEF respectively. Patients received treatment for 4 weeks, diaphragm stimulation Technique 5 repetitions each for 4 seconds duration 3 times a week for 4 weeks, 2 times a week for subsequent weeks and measurement taken at 6th week. By using paired t test analysis that there is a statistically significant improvement $p< 0.05$ in oxygen saturation rate and respiratory rate. Findings show that there is marked improvement in respiratory Outcomes after 6 weeks of performing diaphragmatic stimulation with breathing exercises exhibit the p-value<0.05 which is highly significant. According to statistics, we find out that the oxygen saturation has improved with the mean value of – 1.900 and

standard deviation of 1.094. FVC with the mean value of -.5634 and standard deviation of .66365. All respiratory variables are highly significant with the p-value<0.05. it is concluded that diaphragmetic stimulation shown to be effective in clinical outcomes among patients with respiratory dysfunction.

Keywords: Diaphragmatic stimulation, oximeter, oxygen saturation, dyspnea, breathing rate, spirometry, Asthma, COPD, breathlessness, physiotherapy

1 INTRODUCTION

Asthma is heterogeneous respiratory disease characterized by chronic airway inflammation. It is usually characterized by a history of respiratory symptoms such as severe cough, shortness of breath, chest tightness and wheezing. Signs and symptoms can change over time and intensity. Commonly observed phenotypes include non-allergic, allergic, late-onset, fixed airflow limitation, and obesity asthma [1]. The main symptoms of asthma are cough, shortness of breath, wheezing, chest pain and pressure. Symptoms are always the cause, and causes such as allergies or viral infections must be identified and treated if possible [2]. Asthma is characterized by reversible and episodic inflammation and narrowing of the airways caused by pollution, natural allergens and irritants. It is a multifactorial, complex and immune-mediated process that manifests itself in various clinical symptoms. [3]. It is a highly common chronic disease of the lower respiratory tract that is rapidly rising in prevalence around the world. Asthma has grown inescapable since the 1970s, impacting roughly 300 million people and claiming the lives of approximately 250,000 people. COPD is another major common lung disease causing restricted air flow and difficulty in breathing. smoking and air pollution are the most common cause of COPD.it is a non curable disease but symptoms can be improve by treatment and prevention strategies. emphysema and chronic bronchitis are two most common conditions that contribute to COPD. Asthma and COPD has a major impact on people's physical and psychological well-being, resulting in poor learning efficiency, limited physical activity, and a lower quality of life. As a result, expanding knowledge about respiratory diseases and how to effectively treat them has become major areas of prevention and treatment. Physical education is a generally established addition to medicine and non-pharmacological treatment for patients with respiratory dysfunction. Physical training has been considered as an important aspect of respiratory dysfunction treatment in some countries. [4]. Physical examinations are not enough to diagnose the initial stage of asthma and COPD. In physical examination many subjects show normal findings. In subjects with abnormal findings show signs of wheezing, tight chest, coughing, shortness of breath. In the absence of tests that raised concerns, other techniques were used to confirm the functional impairment. Spirometry is the most reliable approach for identifying asthma and COPD. Tests of lung function are another use for it. Spirometry gauges the lungs' efficiency and capacity. The subject of spirometry must exhale as forcefully as they can through a tube attached to a little device known as a spirometer. An other measure pulse oximeter is used to check the oxygen saturation of the subject and respiratory rate. It is usually placed on a finger tip using light beam to measure to blood oxygen level.

MRC dyspnea scale in the form of questionnaire used to determine the level of breathlessness. The scale has 5 grades;0 no breathlessness,1 shortness of breath while hurrying on the level, 2 walks slower as n In comparison to other people, 3 stops for a while for air after walking for a few minutes on the level undressing, 4 too breathless to leave the house or even when dressing

METHOD AND SUBJECTS In present study we aimed to find the Effect of diaphragmatic stimulation on oxygen saturation, respiratory rate, breathlesness and spirometer variables like FVC, FEV1, PEF, FEF in respiratory dysfunction Patients. To accomplish this outcome 30 participants from physiotherapy OPD Pulmonology department from Allied hospital Faisalabad participated in this study. All candidates were informed with written consent before the participation. Researcher

used convenient sampling technique for data collection. A deep study of history and physical examination were carried out

Inclusion criteria: was the subjects from both gender in the sage group of 40-60 years'diagnosed asthma and COPD patients, low saturation below the 90 and dyspnea scale above 2.

Exclusion criteria: The subjects having Diabetes Mellitus, Arthritis, Cardiovascular diseases, hypertension and substance user of Alcohol and smoking were excluded out spirometer and MRC Scale (Dyspnea Scale), pulse oximeter were the tools used to collect data.

Data analysis: The pair T test was used to examine all data for normal distribution. The relationship between pre and post values of oxygen saturation, dysnea and spirometer was examined using Pearson's correlation coefficient. A P-value of 0.05 was deemed statistically significant.

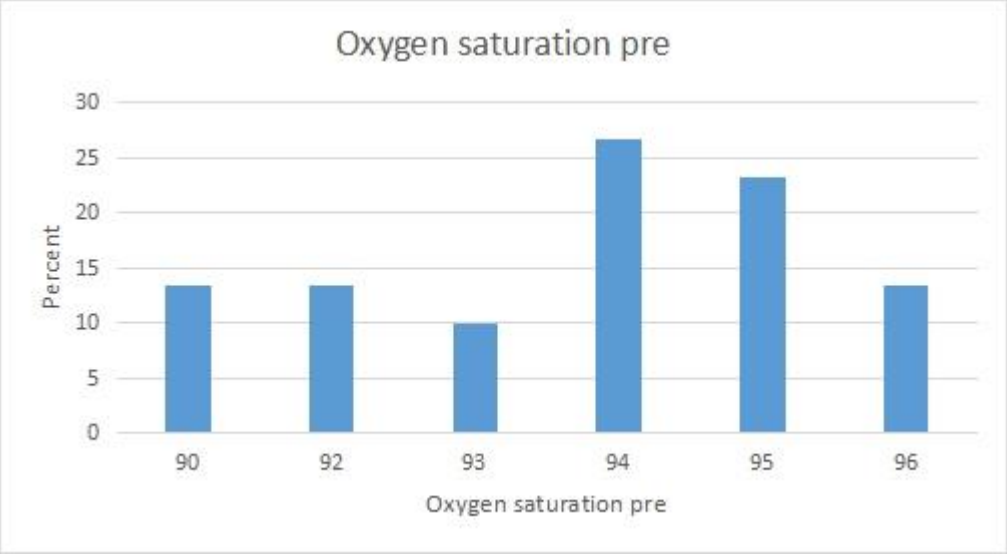
RESULTS: This study looked at the effect of diaphragmatic stimulation with breathing exercises on oxygen saturation, breathlesness and spirometer variables in respiratory dysfunction patients. There is a statistically significant improvement p 0.05 in oxygen saturation rate, respiratory rate and dysnea scale using paired t test analysis. Tables describe the demographic and physiological characteristics of the study participants. The mean and standard deviation Sig. (2-tailed) are presented for all values**.**

Section 1: Pre values measurements

Oxygen saturation pre

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	90	4	13.3	13.3	13.3
	92	4	13.3	13.3	26.7
	93	3	10.0	10.0	36.7
	94	8	26.7	26.7	63.3
	95	7	23.3	23.3	86.7
	96	4	13.3	13.3	100.0
	Total	30	100.0	100.0	

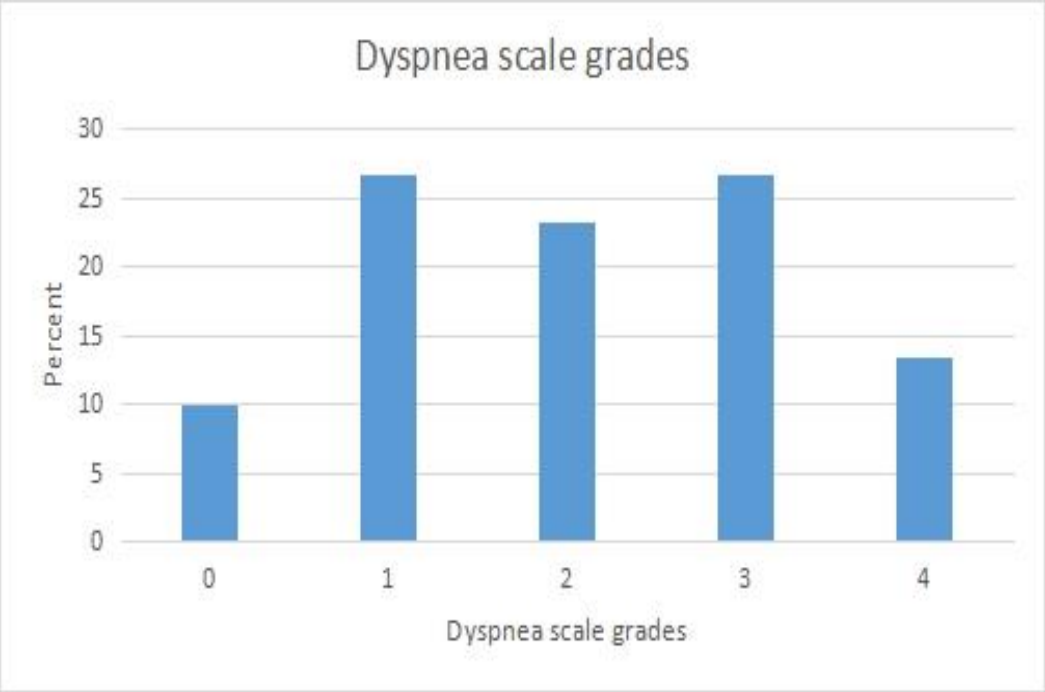
Table 1: In pre Readings of oxygen saturation before the therapy for this study we came to find that 13.3% of the candidates have 90% of the oxygen saturation and another 13.3% have 92%,10% have 93% of the saturation,26.7% of the volunteers have 94%, 23.3% have 95% and 13.3% of the candidates have 96% of the oxygen saturation respectively



Dyspnea scale grades

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	0	3	10.0	10.0	10.0
	1	8	26.7	26.7	36.7
	2	7	23.3	23.3	60.0
	3	8	26.7	26.7	86.7
	4	4	13.3	13.3	100.0
	Total	30	100.0	100.0	

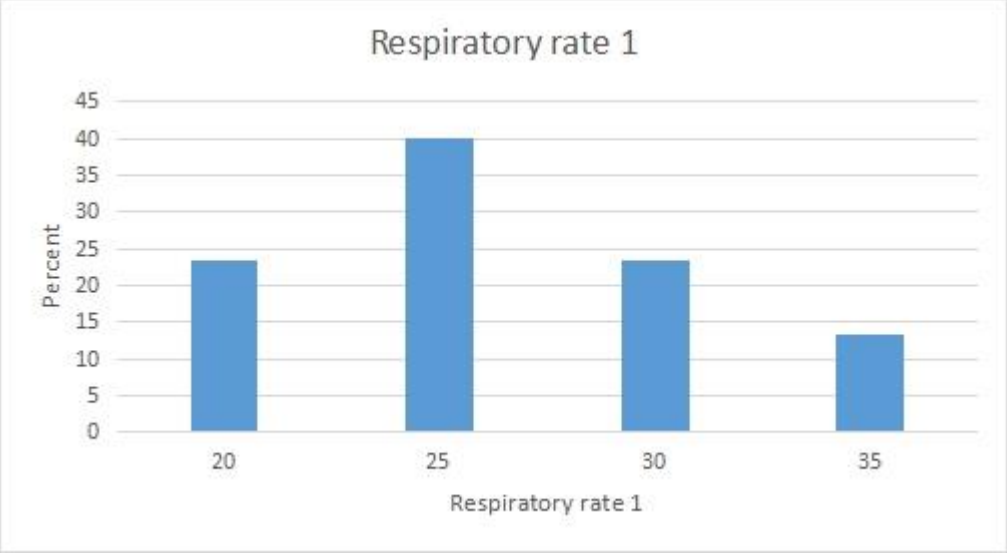
In Pre values for dyspnea scale grades we have come to find the data above in the table. 10.0% of the participants have 0 readings on the dyspnea scale. 26.7% have reading of one,23.3% have reading of two,26.7% have 3 reading on scale, and lastly 13.3% of the participants have 4 grade reading on dyspnea scale.



Respiratory rate

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	20	7	23.3	23.3	23.3
	25	12	40.0	40.0	63.3
	30	7	23.3	23.3	86.7
	35	4	13.3	13.3	100.0
	Total	30	100.0	100.0	

In pre readings of respiratory rate have found that 23.3% of the candidates have breathing rate of 20. 40% of the participants have breathing rate of 25, 23.3% have 30, and lastly 13.3% of the participants have breathing rate of 35.

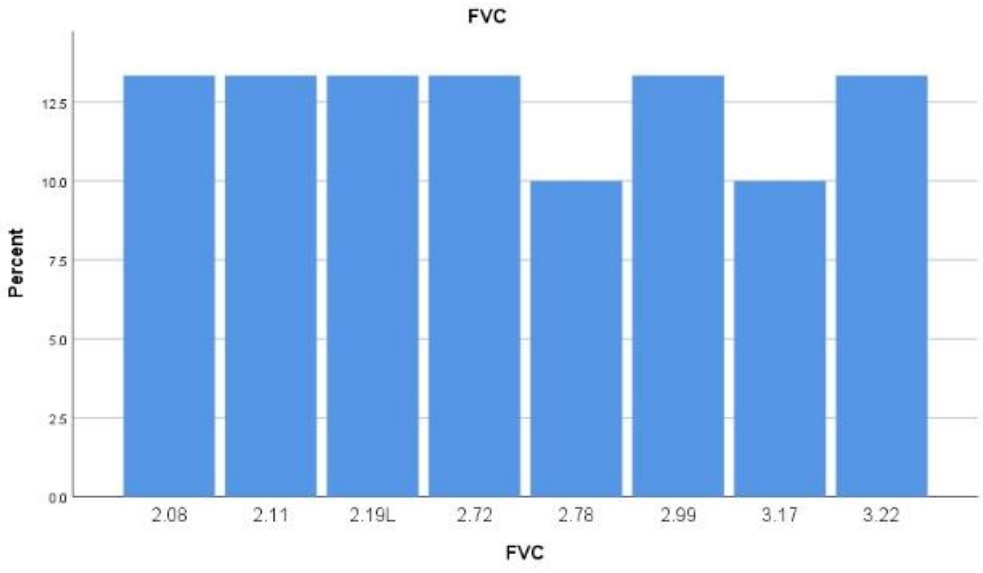


Spirometry Evaluation of participants for pre-therapy Readings

FVC

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	2.08	4	13.3	13.3	13.3
	2.11	4	13.3	13.3	26.7
	2.19L	4	13.3	13.3	40.0
	2.72	4	13.3	13.3	53.3
	2.78	3	10.0	10.0	63.3
	2.99	4	13.3	13.3	76.7
	3.17	3	10.0	10.0	86.7
	3.22	4	13.3	13.3	100.0
	Total	30	100.0	100.0	

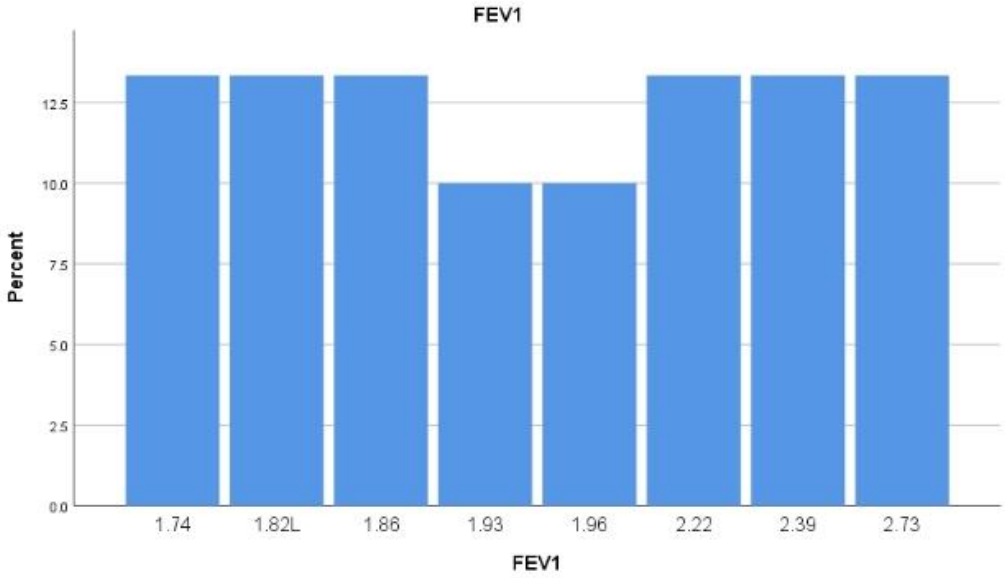
In FVC reading have found that there is range of FVC readings with minimum of 2.08L to 3.22L. In comprehensive way we have 2.08L, 2.11L ,2.19L ,2.72L ,2.78L ,2.99L ,3.17L ,3.22L , of readings in every 3 to 4 frequency respectively.



FEV1

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	1.74	4	13.3	13.3	13.3
	1.82L	4	13.3	13.3	26.7
	1.86	4	13.3	13.3	40.0
	1.93	3	10.0	10.0	50.0
	1.96	3	10.0	10.0	60.0
	2.22	4	13.3	13.3	73.3
	2.39	4	13.3	13.3	86.7
	2.73	4	13.3	13.3	100.0
	Total	30	100.0	100.0	

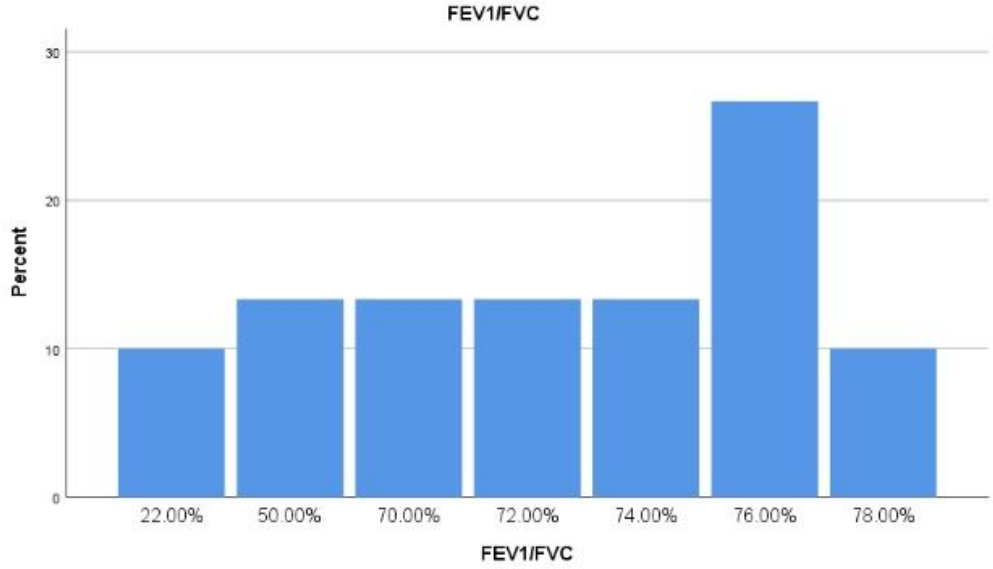
In FEV1 we have found a degree of variations from 1.74L to 2.73L in pre therapy readings. In details we have found 1.74L ,1.82L ,1.86L ,1.93L ,1.96L ,2.22L ,2.39L ,2.73L, in every 3 to 4 frequencies respectively



FEV1/FVC

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	22.00%	3	10.0	10.0	10.0
	50.00%	4	13.3	13.3	23.3
	70.00%	4	13.3	13.3	36.7
	72.00%	4	13.3	13.3	50.0
	74.00%	4	13.3	13.3	63.3
	76.00%	8	26.7	26.7	90.0
	78.00%	3	10.0	10.0	100.0
	Total	30	100.0	100.0	

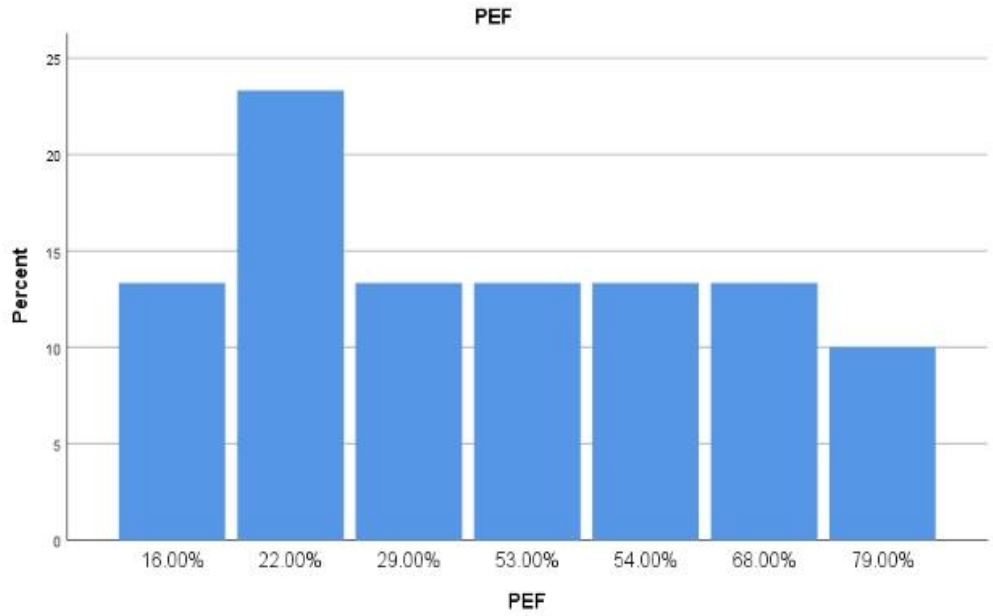
In pre readings of FEV1/FVC we have found that degree of variations in readings with minimum of 22% and maximum as 78%. In detail study of pre readings we have found 22%.50%,70%, 72%,74%,76%,78% of the FEV1/FVC readings in every 3 to 4 frequencies respectively 76% have the highest with 8 frequencies.



PEF

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	16.00%	4	13.3	13.3	13.3
	22.00%	7	23.3	23.3	36.7
	29.00%	4	13.3	13.3	50.0
	53.00%	4	13.3	13.3	63.3
	54.00%	4	13.3	13.3	76.7
	68.00%	4	13.3	13.3	90.0
	79.00%	3	10.0	10.0	100.0
	Total	30	100.0	100.0	

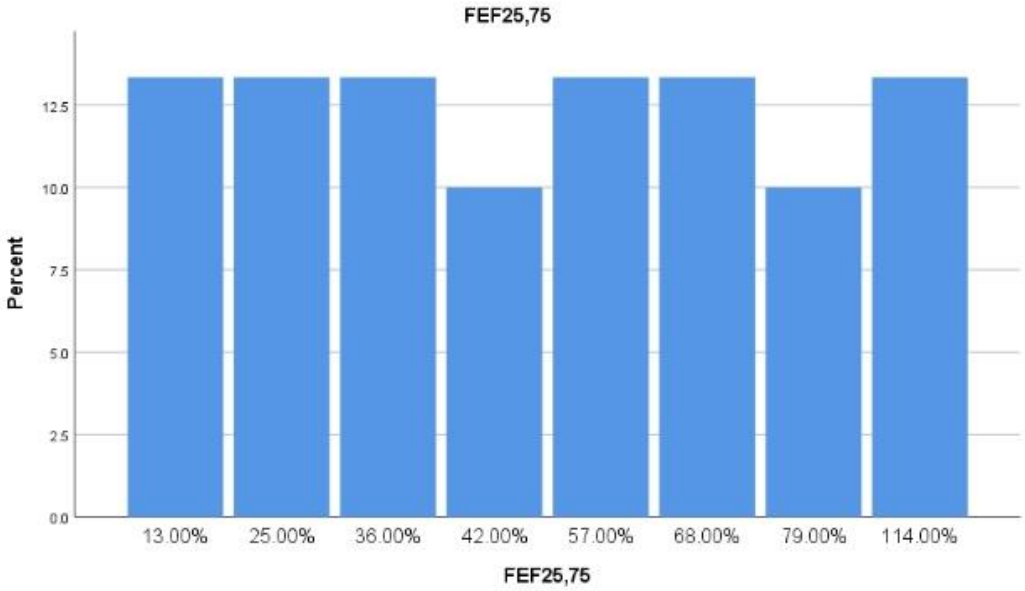
In PEF reading we have high degree of variations with minimum of 16% and maximum of 79%. In detail analysis we have 16% ,22% ,29% ,53%, 54%, 68%, 79% in every 3 to 4 frequencies and we have 22% as higher with the 7 frequencies.



FEF25,75

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	13.00%	4	13.3	13.3	13.3
	25.00%	4	13.3	13.3	26.7
	36.00%	4	13.3	13.3	40.0
	42.00%	3	10.0	10.0	50.0
	57.00%	4	13.3	13.3	63.3
	68.00%	4	13.3	13.3	76.7
	79.00%	3	10.0	10.0	86.7
	114.00%	4	13.3	13.3	100.0
	Total	30	100.0	100.0	

In FEF25,75 we have found a minimum reading of 13% and a highest reading of 114% while talking about the detail breakdown we have 13%, 25% ,36%, 42%, 57%, 68%, 79%, 114%. In every # to 4 frequencies in pre therapeutic readings for dyspnea in COPd.



Descriptive Statistics

	N	Minimum	Maximum	Mean	Std. Deviation
Age	30	17	25	20.67	1.988
Oxygen saturation pre	30	90	96	93.60	1.868
Dyspnea scale grades	30	0	4	2.07	1.230
Respiratory rate 1	30	20	35	26.33	4.901
FVC	30	2	3	2.64	.453
FEV1	30	2	3	2.09	.331
FEV1/FVC	30	22.00%	78.00%	65.7333%	17.14629%
PEF	30	16.00%	79.00%	42.3667%	22.00859%
FEF25,75	30	13.00%	114.00%	53.8333%	31.57376%
Valid N (listwise)	30				

For a broad picture of the breakdown of pre readings for this study have found the above statistic. Minimum oxygen saturation is 90 and maximum is 96 with mean of 93.60. on Dyspnea scale we have minimum value of 0 and maximum value of 4 with mean of 2.07. Talking about respiratory

rate minimum respiratory rate is 20 and maximum rate is 35 with mean value of 26.33. FVC have minimum reading of 2L and maximum of 3L with mean of 2.64 FEV1 have minimum value of 2L and maximum of 3 L with mean of 2.09. FEV1/FVC have minimum value of 22% and maximum value of 78% with mean of 65.73%. while PEF have minimum of 16% maximum of 79% with mean of 42% and lastly the FEF25,75 we have minimum value of 13% and a maximum value of 114% with mean of 53.83%. All this above study encloses wore condition of the COPD patients.

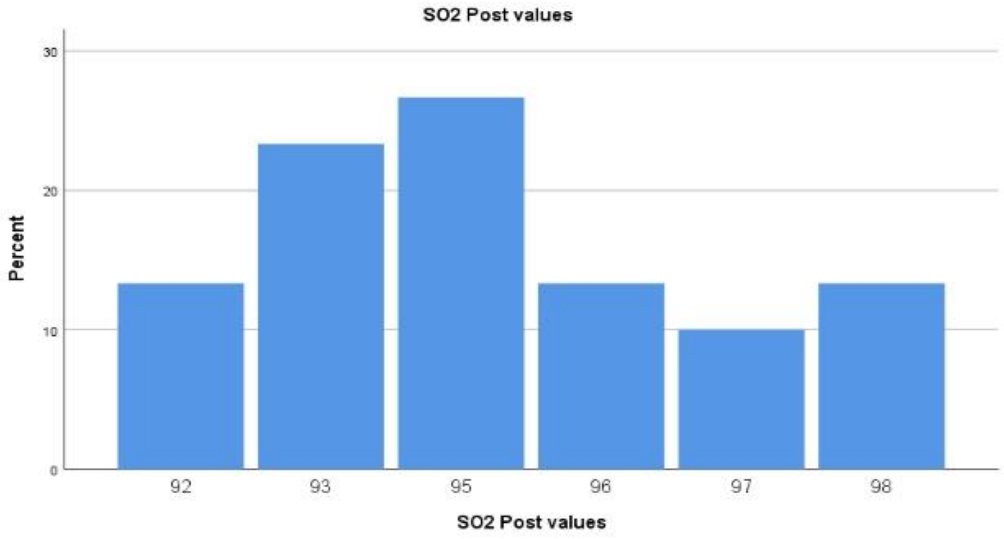
Post Reading After 4 weeks of therapy (effects of diaphragmatic stimulation with breathing exercises on clinical outcome among patients with respiratory dysfunction)

We had taken post readings in patients with rezspiratory dysfunction after the therapy and we have come to find the following details.

SO2 Post values

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	92	4	13.3	13.3	13.3
	93	7	23.3	23.3	36.7
	95	8	26.7	26.7	63.3
	96	4	13.3	13.3	76.7
	97	3	10.0	10.0	86.7
	98	4	13.3	13.3	100.0
	Total	30	100.0	100.0	

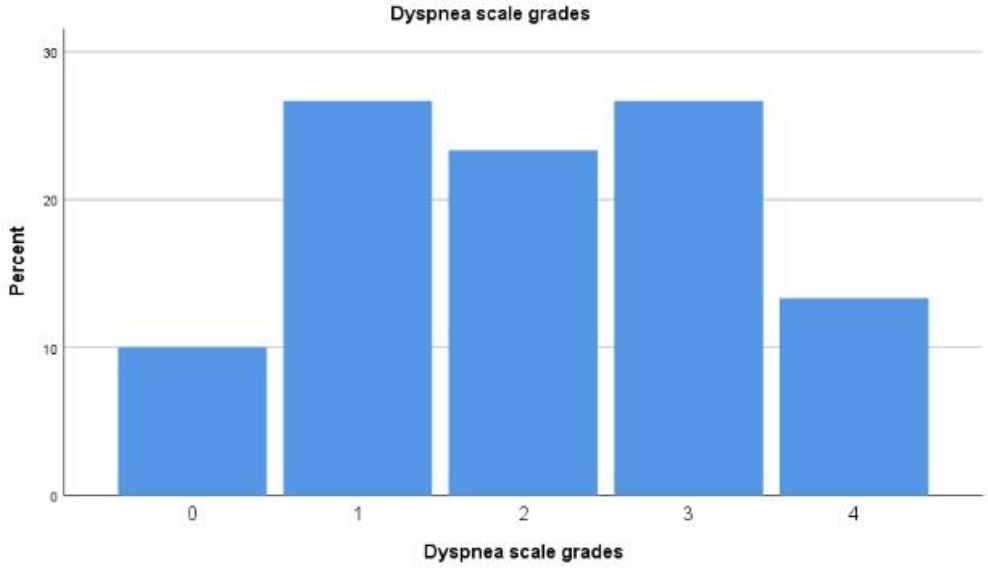
After therapy we can see some clear effectiveness on oxygen saturation in pre value the minimum oxygen saturation was 90 but after therapy the minimum oxygen saturation is 92% which shows the effectiveness of therapy. And improvements in some of the patients



Dyspnea scale grades

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	0	3	10.0	10.0	10.0
	1	9	30.0	30.0	40.0
	2	11	36.7	36.7	76.7
	3	7	23.3	23.3	100.0
	Total	30	100.0	100.0	

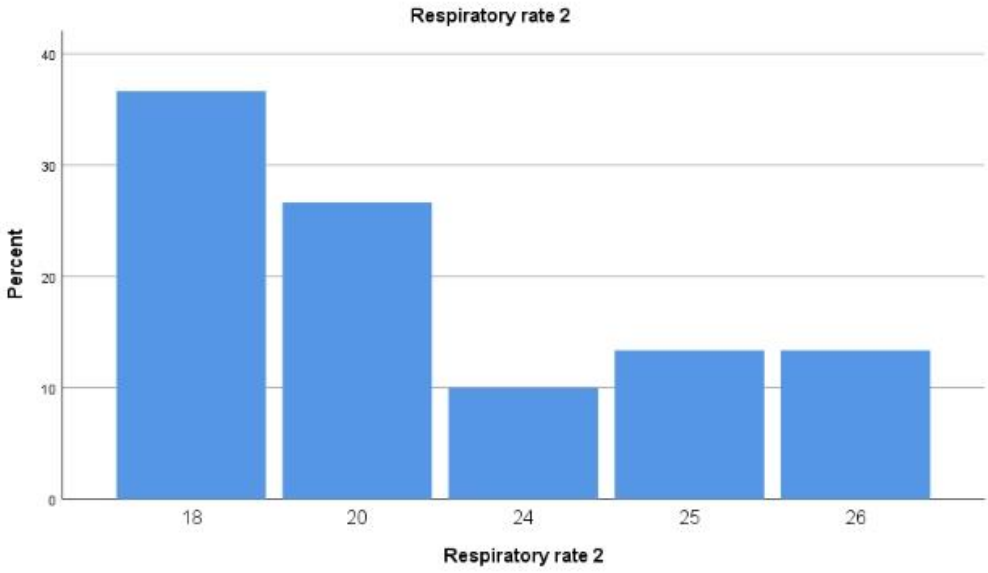
On dyspnea scale we can also see some clear improvements as we had 4 As a maximum grade but after therapy we had 3 as the maximum grade in the patient of COPD with shows the effectiveness of the therapy.



Respiratory rate

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	18	11	36.7	36.7	36.7
	20	8	26.7	26.7	63.3
	24	3	10.0	10.0	73.3
	25	4	13.3	13.3	86.7
	26	4	13.3	13.3	100.0
	Total	30	100.0	100.0	

In breathing rate, we have also seen some clear improvements as there were 35 As the highest no of breathing rate as patients were in high degree of hyper ventilations but after therapy their breathing rate is quite normal towards the standard breathing rate.

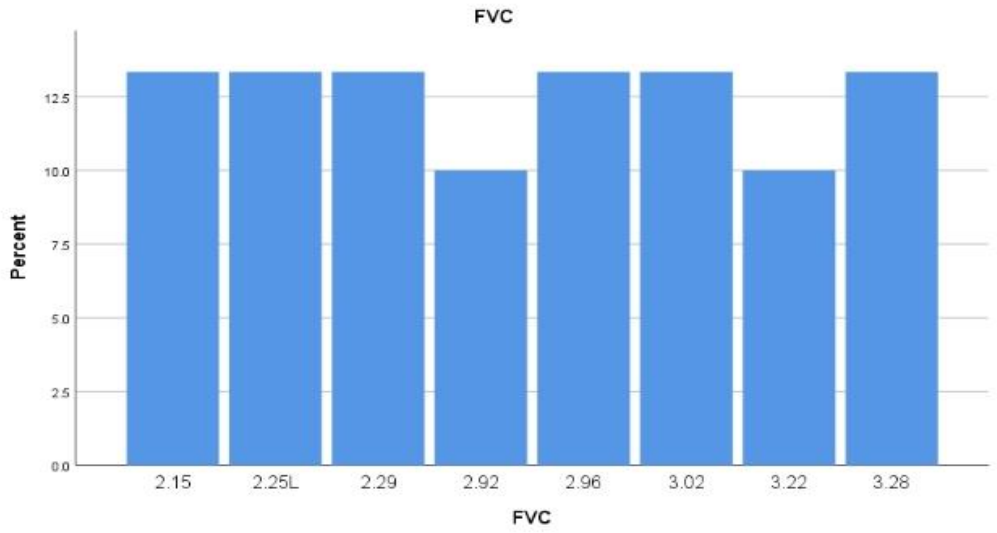


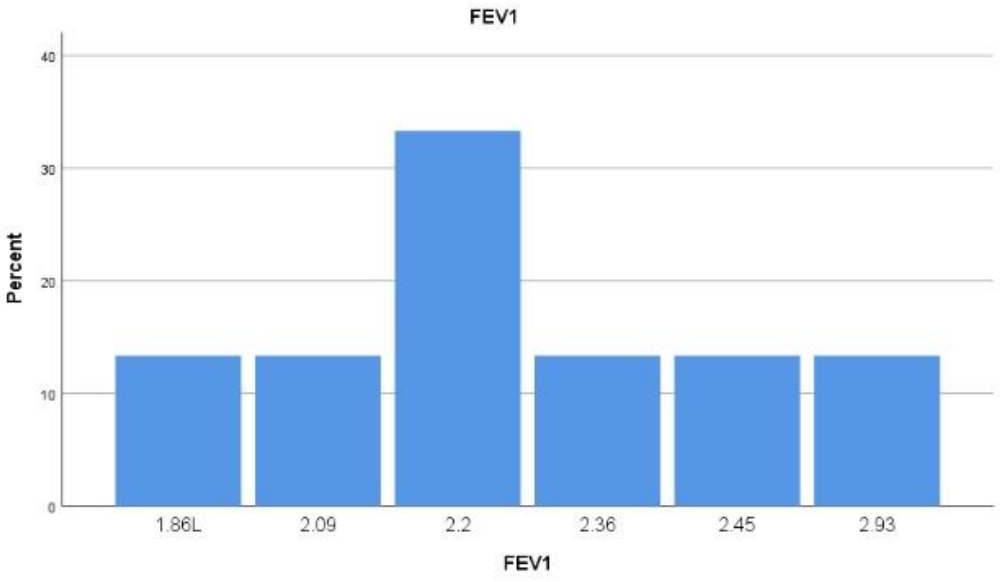
Spirometry After 4 Weeks of Therapy:

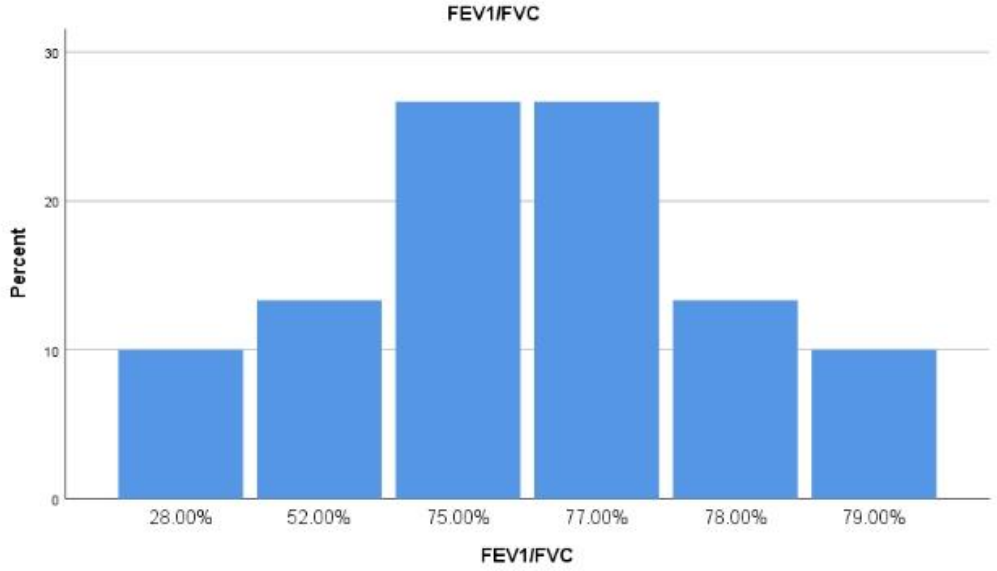
Descriptive Statistics

	N	Minimum	Maximum	Mean	Std. Deviation
FVC	30	2	3	2.77	.450
FEV1	30	2	3	2.44	.338
FEV1/FVC	30	28.00%	79.00%	68.5667%	16.20703%
PEF	30	26.00%	80.00%	46.8000%	19.54376%
FEF25,75	30	21.00%	115.00%	58.4333%	30.00768%
Valid N (listwise)	30				

The descriptive Statues of Spirometry Also show some improvements after the 4 week as we have come to see the increase in the means values of FVC which are now 2.77 and in pre values it was 2.64, in FEV1 mean value is 2.44 which was 2.09 in pre values ,In FEV1/FVC mean value is 68.5% which also show some improvement as compare to 65.73%,in PEF mean value is now 46.8% and it was 42.36% in pre values. And lastly FEF25,75 have a mean of 58.43% as compared to previous 53.43%. all of this description in the post values are an evidence for the effectiveness of therapy.






FEV1/FVC
Percent
30
20
10
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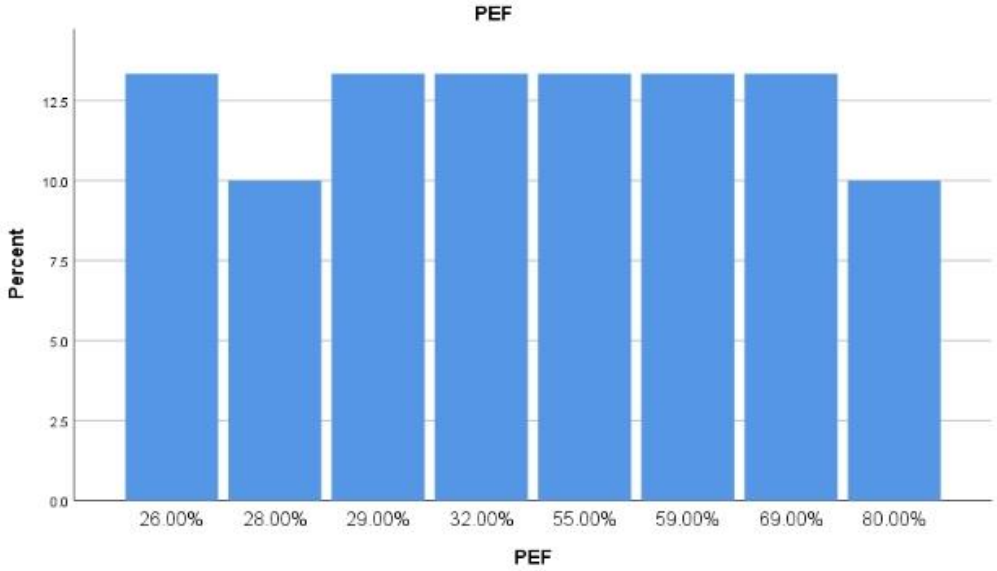
FEV1/FVC


PEF
Percent
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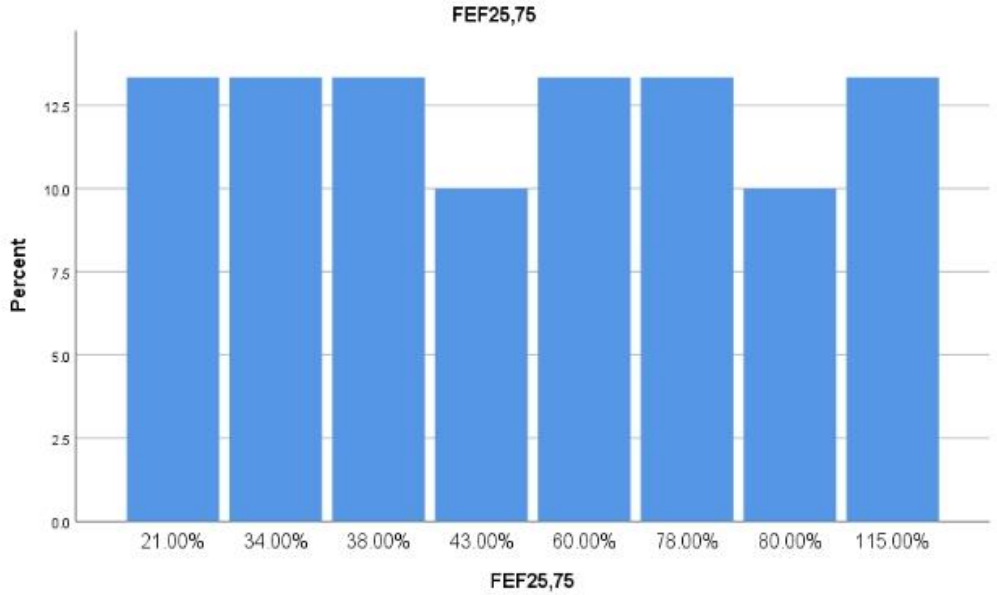
PEF


FEF25,75
Percent
12.5
10.0
7.5
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2.5
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21.00%
34.00%
38.00%
43.00%
60.00%
78.00%
80.00%
115.00%
FEF25,75

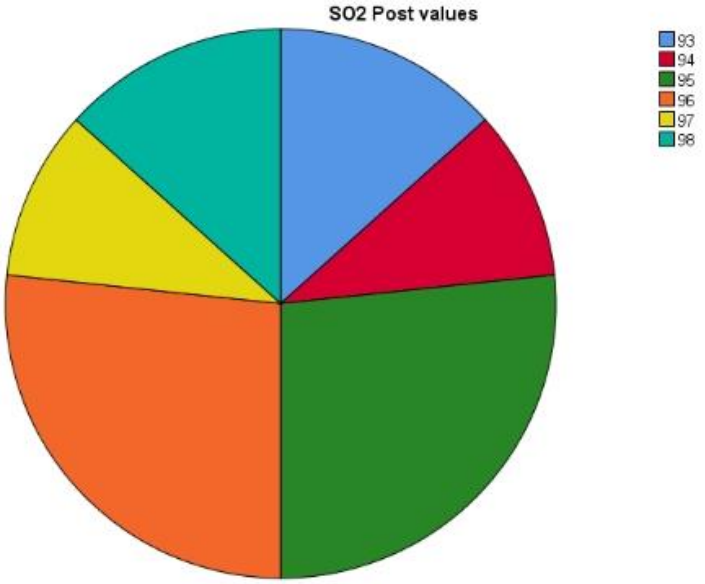
Post Reading After 6 weeks of therapy

We had taken Another post reading in respiratory dysfunction patients after 6 week of the therapy and we have come to find the following details.

SO2 Post 6 week values

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	93	4	13.3	13.3	13.3
	94	3	10.0	10.0	23.3
	95	8	26.7	26.7	50.0
	96	8	26.7	26.7	76.7
	97	3	10.0	10.0	86.7
	98	4	13.3	13.3	100.0
	Total	30	100.0	100.0	

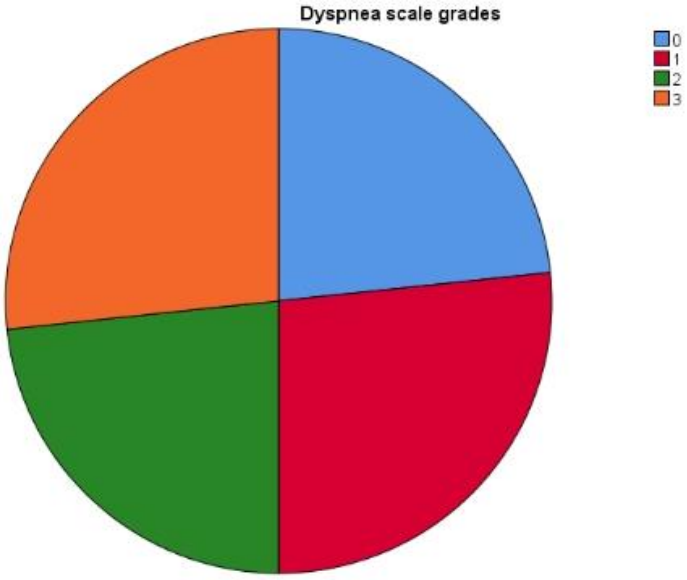
After 6 weeks of therapy we can see some clear effectiveness on oxygen saturation then in 4 weeks and pre value the minimum oxygen saturation was 90 but after 6 weeks of therapy the minimum oxygen saturation is 93% which shows the further effectiveness of therapy. And improvements in some of the patients



Dyspnea scale grades

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	0	7	23.3	23.3	23.3
	1	8	26.7	26.7	50.0
	2	7	23.3	23.3	73.3
	3	8	26.7	26.7	100.0
	Total	30	100.0	100.0	

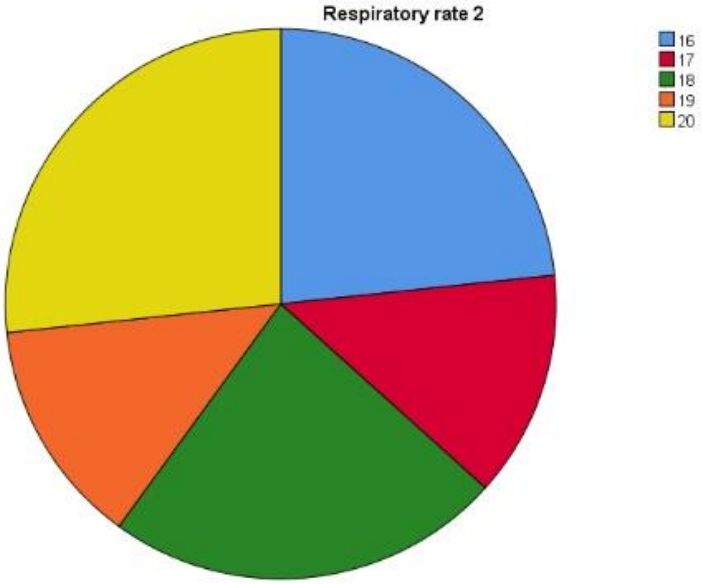
On dyspnea scale we can also see some clear improvements as we had 4 As a maximum grade but after therapy we had 3 as the maximum grade but it has also less number of frequencies in the patient of respiratory dysfunction which shows the effectiveness of the therapy.



Respiratory rate 2

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	16	7	23.3	23.3	23.3
	17	4	13.3	13.3	36.7
	18	7	23.3	23.3	60.0
	19	4	13.3	13.3	73.3
	20	8	26.7	26.7	100.0
	Total	30	100.0	100.0	

In breathing rate, we have also seen some clear improvements as there were 35 As the highest no of breathing rate as patients were in high degree of hyper ventilations but after therapy their breathing rate is quite normal towards the standard breathing rate. As compare to improvements in 4th week 26 was the maximum breathing rate but after 6th week 20 is highest which is closer to normal breathing rate



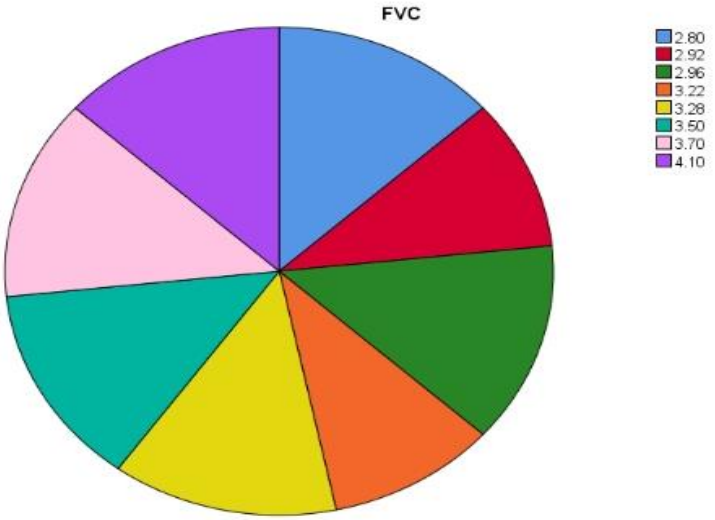
Spirometry After 6 Weeks of Therapy:

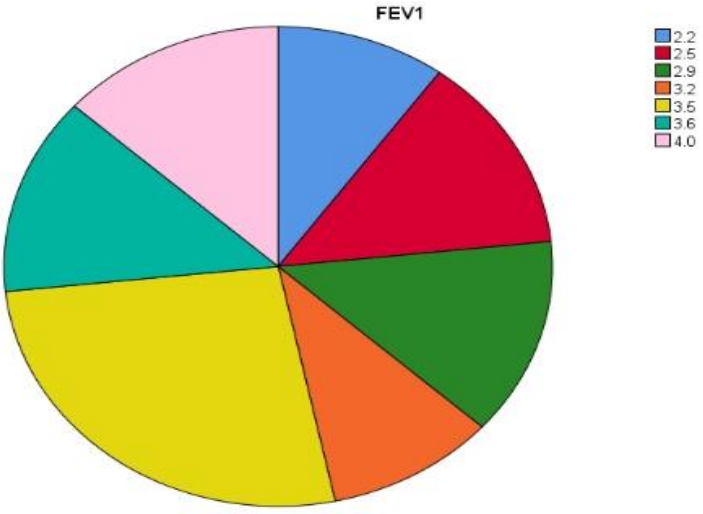
Descriptive Statistics

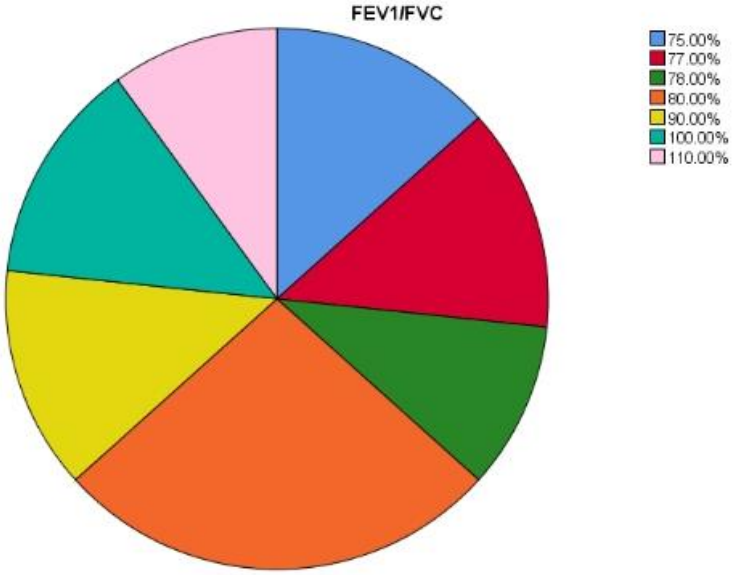
	N	Minimum	Maximum	Mean	Std. Deviation
FVC	30	2.80	4.10	3.3260	.42573
FEV1	30	2.2	4.0	3.207	.5644
FEV1/FVC	30	75.00%	110.00%	85.7333%	11.53984%
PEF	30	32.00%	90.00%	72.1000%	17.26737%
FEF25,75	30	69.00%	115.00%	84.6000%	16.04434%
Valid N (listwise)	30				

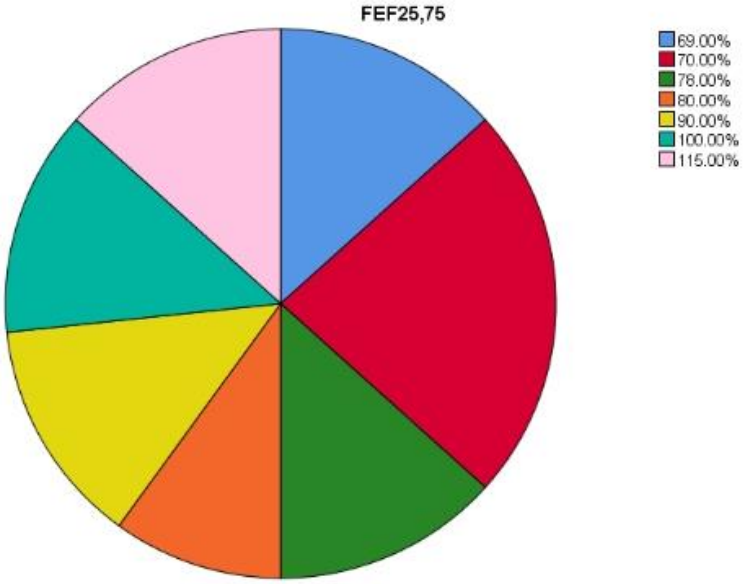
The descriptive Statues of Spirometry Also show some more improvements then pre values and 4th week of therapy, after the 6 week as we have come to see the increase in the means values of FVC which are now3.3260 which were 2.77 in 4th week and in pre values it was 2.64, in FEV1 mean value is 3.207 in was 2.44 in 4th week and was 2.09 in pre values ,In FEV1/FVC mean value is 85.73% it was 68.5% in 4th week and was 65.73% in pre values ,in PEF mean value is now 72.10% in 4th week it was 46.8% and it was 42.36% in pre values. And lastly FEF25,75 have a mean of 84.60% as it was 58.43% in 4th week as compared to previous 53.43%. all of this description in the post values are an evidence for the effectiveness of therapy.

Here is pie chart presentation of the spirometry after the 6th week of therapy









Comparison of pre-oxygen saturation and post 4 week values of oxygen saturation

Paired Samples Statistics

		Mean	N	Std. Deviation	Std. Error Mean
Pair 1	Oxygen saturation pre	93.60	30	1.868	.341
	SO2 Post 4 week values	94.87	30	1.995	.364

Paired Samples Test

	Paired Differences					t	Df	Sig. (2-tailed)
				95% Confidence Interval of the Difference				
	Mean	Std. Deviation	Std. Error Mean	Lower	Upper			
Pair 1 Oxygen saturation pre - SO2 Post 4 week values	-1.267	.980	.179	-1.633	-.901	-7.077	29	.000

Interpretations:
Table above is comparison of pre oxygen saturation value and value after the 4 weeks of treatment. So by comparison we have found change in the means of pre oxygen saturation mean (93.60) and after in the mean of values of oxygen saturation after 4 week of treatment (94.87). results of paired sample t test show significant difference in the means of pre and post value with p-value<0.05

Comparison of pre-oxygen saturation and post 6 week values of oxygen saturation

Paired Samples Statistics

		Mean	N	Std. Deviation	Std. Error Mean
Pair 1	Oxygen saturation pre	93.60	30	1.868	.341
	SO2 Post 6 week values	95.50	30	1.526	.279

Paired Samples Test

		Paired Differences					t	df	Sig. (2-tailed)
		Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference Lower	Upper			
Pair 1	Oxygen saturation pre - SO2 Post 6 week values	-1.900	1.094	.200	-2.308	-1.492	-9.514	29	.000

Interpretations:
Table above is comparison of pre oxygen saturation value and value after the 6 weeks of treatment. So by comparison we have found change in the means of pre oxygen saturation mean (93.60) and after in the mean of values of oxygen saturation after 6 week of treatment (95.50). results of paired sample t test show significant difference in the means of pre and post value with p-value<0.05

Comparison of pre- Dyspnea scale grades and post 4 week values of Dyspnea scale grades

Paired Samples Statistics

		Mean	N	Std. Deviation	Std. Error Mean
Pair 1	Dyspnea scale grades pre values	2.07	30	1.230	.225
	Dyspnea scale grades Post 4 week values	2.00	30	1.259	.230

Paired Samples Test

		Paired Differences					t	df	Sig. (2-tailed)
		Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference Lower	Upper			
Pair 1	Dyspnea scale grades pre values - Dyspnea scale grades Post 4 week values	.067	.450	.082	-.101	.235	.812	29	.423

Interpretations
The above table shows the pre- dyspnea scale values and values after 4 weeks of exercise. So by comparison we have found changes in the means of pre dyspnea scale values(2.07) and after in the means of values of post 4 weeks dyspnea scale (2.00). Results of paired t- test shows the significant difference in the means of pre and post 4 weeks values with p value of 0.423.

Comparison of pre- Dyspnea scale grades and post 6 week values of Dyspnea scale grades

Paired Samples Statistics

		Mean	N	Std. Deviation	Std. Error Mean
Pair 1	Dyspnea scale grades pre values	2.07	30	1.230	.225
	Dyspnea scale grades Post 6 week values	1.53	30	1.137	.208

Paired Samples Test

		Paired Differences					t	df	Sig. (2-tailed)
		Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference Lower	Upper			
Pair 1	Dyspnea scale grades pre values - Dyspnea scale grades Post 6 week values	.533	1.042	.190	.144	.922	2.804	29	.009

Interpretations

The above table shows the pre- dyspnea scale values and values after 6 weeks of exercise. So by comparison we have found changes in the means of pre dyspnea scale values(2.07) and after in the means of values of post 6 weeks dyspnea scale (1.53). Results of paired t- test shows the significant difference in the means of pre and post 6 weeks values with p-value<0.05

Comparison of pre- Breathing rate and post 4 week values of Breathing rate

Paired Samples Statistics

		Mean	N	Std. Deviation	Std. Error Mean
Pair 1	Respiratory rate pre values	26.33	30	4.901	.895
	Respiratory rate 2 Post 4 week values	21.13	30	3.203	.585

Paired Samples Test

		Paired Differences					t	df	Sig. (2-tailed)
		Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference Lower	Upper			
Pair 1	Respiratory rate pre values - Respiratory rate 2 Post 4 week values	5.200	2.235	.408	4.366	6.034	12.746	29	.000

Interpretations

The above table shows the pre- breathing rate values and values after 4 weeks of exercise. So by comparison we have found changes in the means of pre- breathing rate values(26.33) and after in the means of values of post 4 weeks breathing rate(21.13). Results of paired t- test shows the significant difference in the means of pre and post 4 weeks values with p value 0.000 which is <0.05

Comparison of pre- Breathing rate and post 6 week values of Breathing rate

Paired Samples Statistics

		Mean	N	Std. Deviation	Std. Error Mean
Pair 1	Respiratory rate pre values	26.33	30	4.901	.895
	Respiratory rate Post 6 week values	18.07	30	1.530	.279

Paired Samples Test

		Paired Differences					t	df	Sig. (2-tailed)
		Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference Lower	Upper			
Pair 1	Respiratory rate pre values - Respiratory rate Post 6 week values	8.267	4.806	.877	6.472	10.061	9.421	29	.000

Interpretations

The above table shows the pre-breathing rate values and values after 6 weeks of exercise. So by comparison we have found changes in the means of pre- breathing rate values(26.33) and after in the means of values of post 6 weeks breathing rate (18.07). Results of paired t- test shows the significant difference in the means of pre and post 6 weeks values with p value<0.05.

Comparison of pre- FEV1 values and post 4 week values of FEV1

Paired Samples Statistics

		Mean	N	Std. Deviation	Std. Error Mean
Pair 1	FEV1/FVC pre values	65.7333%	30	17.14629%	3.13047%
	FEV1/FVC Post 4 week values	68.5667%	30	16.20703%	2.95899%

Paired Samples Test

		Paired Differences					t	df	Sig. (2-tailed)
		Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference Lower	Upper			
Pair 1	FEV1/FVC pre values - FEV1/FVC Post 4 week values	-2.83333%	1.80198%	0.32899%	-3.50620%	-2.16046%	-8.612	29	.000

Interpretations

The above table shows the pre-FEV1 values and values after 4 weeks of exercise. So by comparison we have found changes in the means of pre-FEV1 values(65.733%) and after in the means of values of post 4 weeks FEV1 (68.5667%). Results of paired t- test shows the significant difference in the means of pre and post 4 weeks values with p-value of 0.000 which is highly significant.

Comparison of pre- FEV1 values and post 6 week values of FEV1

Paired Samples Statistics

		Mean	N	Std. Deviation	Std. Error Mean
Pair 1	FEV1/FVC pre values	65.7333%	30	17.14629%	3.13047%
	FEV1/FVC Post 6 week values	85.7333%	30	11.53984%	2.10688%

Paired Samples Test

		Paired Differences					t	df	Sig. (2-tailed)
		Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference Lower	Upper			
Pair 1	FEV1/FVC pre values - FEV1/FVC Post 6 week values	-20.00000%	16.86457%	3.07904%	-26.29733%	-13.70267%	-6.496	29	.000

Interpretations

The above table shows the pre-FEV1 values and values after 6 weeks of exercise. So by comparison we have found changes in the means of pre-FEV1 values(65.7333%) and after in the means of values of post 6 weeks FEV1(85.7333%). Results of paired t- test shows the significant difference in the means of pre and post 6 weeks values with p value of 0.000.

Comparison of pre- PEF values and post 4 week values of PEF

Paired Samples Statistics

		Mean	N	Std. Deviation	Std. Error Mean
Pair 1	PEF pre values	42.3667%	30	22.00859%	4.01820%
	PEF Post 4 week values	46.8000%	30	19.54376%	3.56819%

Paired Samples Test

		Paired Differences					t	df	Sig. (2-tailed)
		Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference Lower	Upper			
Pair 1	PEF pre values - PEF Post 4 week values	-4.43333%	3.07025%	0.56055%	-5.57978%	-3.28688%	-7.909	29	.000

Interpretations

The above table shows the pre-PEF values and values after 4 weeks of exercise. So by comparison we have found changes in the means of pre-PEF values(42.3667%) and after in the means of values of post 4 weeks PEF values(46.8000%). Results of paired t- test shows the significant difference in the means of pre and post 4 weeks values with p-value<0.05.

Comparison of pre- PEF values and post 6 week values of PEF

Paired Samples Statistics

		Mean	N	Std. Deviation	Std. Error Mean
Pair 1	PEF pre values	42.3667%	30	22.00859%	4.01820%
	PEF Post 6 week values	72.1000%	30	17.26737%	3.15258%

Paired Samples Test

		Paired Differences					t	df	Sig. (2-tailed)
		Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference Lower	Upper			
Pair 1	PEF pre values - PEF Post 6 week values	-29.73333%	25.82959%	4.71582%	-39.37826%	-20.08841%	-6.305	29	.000

Interpretations

The above table shows the pre-PEF values and values after 6 weeks of exercise. So by comparison we have found changes in the means of pre-PEF values(42.3667%) and after in the means of values of post 6 PEF values(72.1000%). Results of paired t- test shows the significant difference in the means of pre and post 6 weeks values with p value <0.05.

Comparison of pre- FEF25,75 values and post 4 week values of FEF25,75

Paired Samples Statistics

		Mean	N	Std. Deviation	Std. Error Mean
Pair 1	FEF25,75 pre values	58.4333%	30	30.00768%	5.47863%
	FEF25,75 Post 4 week values	53.8333%	30	31.57376%	5.76455%

Paired Samples Test

		Paired Differences					t	df	Sig. (2-tailed)
		Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference Lower	Upper			
Pair 1	FEF25,75 pre values - FEF25,75 Post 4 week values	4.60000%	3.74718%	0.68414%	3.20078%	5.99922%	6.724	29	.000

Interpretations

The above table shows the pre-FEF25,75 values and values after 4 weeks of exercise. So by comparison we have found changes in the means of pre-FEF25,75(58.4333%) and after in the means of values of post 4 weeks FEF25,75 (53.8333%). Results of paired t- test shows the significant difference in the means of pre and post 4 weeks values with p value of 0.000.

Comparison of pre- FEF25,75 values and post 6 week values of FEF25,75

Paired Samples Statistics

		Mean	N	Std. Deviation	Std. Error Mean
Pair 1	FEF25,75 pre values	58.4333%	30	30.00768%	5.47863%
	FEF25,75 Post 6 week values	84.6000%	30	16.04434%	2.92928%

Paired Samples Test

		Paired Differences					t	df	Sig. (2-tailed)
		Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference Lower	Upper			
Pair 1	FEF25,75 pre values - FEF25,75 Post 6 week values	-26.16667%	26.13900%	4.77231%	-35.92713%	-16.40621%	-5.483	29	.000

Interpretations

The above table shows the pre-FEF25,75 values and values after 6 weeks of exercise. So by comparison we have found changes in the means of pre-FEF25,75 values(58.4333%) and after in the means of values of post 6 weeks of FEF25,75 (84.6000%). Results of paired t- test shows the significant difference in the means of pre and post 6 weeks values with p value of 0.000.

Comparison of pre- FVC values and post 4 week values of FVC

Paired Samples Statistics

		Mean	N	Std. Deviation	Std. Error Mean
Pair 1	FVC pre values	2.71	26	.449	.088
	FVC Post 4 week values	2.82	26	.425	.083

Paired Samples Test

		Paired Differences					t	Df	Sig. (2-tailed)
		Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference Lower	Upper			
Pair 1	FVC pre values - FVC Post 4 week values	-.111	.076	.015	-.142	-.081	-7.503	25	.000

Interpretations

The above table shows the pre-FVC values and values after 4 weeks of exercise. So by comparison we have found changes in the means of pre-FVC values(2.71) and after in the means of values of post 4 weeks FVC (2.82). Results of paired t- test shows the significant difference in the means of pre and post 4 weeks values with p value of 0.000.

Comparison of pre- FVC values and post 6 week values of FVC

Paired Samples Statistics

		Mean	N	Std. Deviation	Std. Error Mean
Pair 1	FVC pre values	2.71	26	.449	.088
	FVC Post 6 week values	3.2685	26	.42944	.08422

Paired Samples Test

		Paired Differences					t	Df	Sig. (2-tailed)
		Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference Lower	Upper			
Pair 1	FVC pre values - FVC Post 6 week values	-.56346	.66365	.13015	-.83152	-.29541	-4.329	25	.000

Interpretations

The above table shows the pre-FVC values and values after 6 weeks of exercise. So by comparison we have found changes in the means of pre-FVC values(2.71) and after in the means of values of post 6 weeks FVC (3.2685). Results of paired t- test shows the significant difference in the means of pre and post 6 weeks values with p value of 0.000.

DISCUSSION

This experimental study is done on respiratory dysfunction participants with COPD and astma, to see the effects of diaphragmatic stimulation with breathing exercises on respiratory outcomes in them. Respiratory risk factors were checked to protect them from other adverse effects. Risk factors, pattern of breathing, severity of breathlessness are studied so that findings can help participants concerned for physiotherapy intervention.In this study males and females both of age between 40-60 years were included. 30 participants were selected on the basis of inclusion criteria. All the participants were explained about the purpose of our study before the start of exercise. The consent form was signed from all the participants and clearly explained them about the procedure of pursed lip breathing. All the participants were assessed by using pulse oximeter for oxygen saturation measurement and respiratory rate, MRC dyspnea scale for the grade of breathlessness and by spirometry for respiratory outcomes. The purpose of that study was to determine the effect of diaphragmatic stimulation with breathing exercises on the Scale of Breathlessness, oxygen saturation (SaO2) and on spirometry variables in respiratory dysfunction patients. The data was then evaluated by using descriptive statistics.

We measured the pre values of all the variables before starting exercise and then measured their post 4 weeks values and post 6 weeks values respectively. After therapy we can see some clear effectiveness on oxygen saturation in pre value the minimum oxygen saturation was 90% but after therapy the minimum oxygen saturation is 92% which shows the effectiveness of therapy and after 6 weeks minimum oxygen saturation is 93% which shows more effectiveness. On dyspnea scale we can also see some clear improvements as we had 4 As a maximum grade but after therapy we had 3 as the maximum grade in the patient of asthama and COPD which shows the effectiveness of the therapy. In breathing rate, we have also seen some clear improvements as there were 35. After therapy their breathing rate is quite normal about 20 towards the standard breathing rate after 6 weeks. And improvements in some of the patients The descriptive Statistics of Spirometry shows some more improvements then pre values and 4^{th} week of therapy, after the 6 week as we have come to see the increase in the means values of FVC which is 3.3260 which were 2.77 in 4^{th} week and in pre values it was 2.64, in FEV1 mean value is 3.207 in was 2.44 in 4^{th} week and was 2.09 in pre values ,In FEV1/FVC mean value is 85.73% it was 68.5% in 4^{th} week and was 65.73% in pre values ,in PEF mean value is now 72.10% in 4^{th} week it was 46.8% and it was 42.36% in pre values. And lastly FEF25,75 have a mean of 84.60% as it was 58.43% in 4^{th} week as compared to previous 53.4%. All of this description in the post values are an evidence for the effectiveness of therapy. There is marked improvement in oxygen saturation, breathing rate, FEV1, PEF, FEF25,75 with the significance of p-value<0.05. there is the improvement in respiratory outcomes equally in asthmatic and copd participants through diaphragmatic stimulation with breathing exercises. As the p value we obtained is 0.000 or less than 0.05 which are highly significant it shows highly significance of diaphragmatic stimulation with breathing exercises on respiratory variables. According to data interpretation it is concluded that There is effect of diaphragm stimulation with breathing exercises on clinical respiratory outcomes among patients with respiratory dysfunction. Comparison between pre and post treatment values of oxygen saturation rate, by patient 0.000 which indicates highly significant results. Out of 30 members 21 were female patients and 9 were Male patients. This implies that asthma is more pervasive in female orientation when contrasted with the guys. 70% patients are females and just 30 patients are guys. Age of patient's shifts between 40 years to 60 years.. Pre-post analysis of oxygen saturation rate in asthmatic and copd patients also showed significant results as the p-value <0.05 as it improved after treatment in patients.. Comparison of the dyspnea scale rating in asthmatic and COPD patient before the treatment and after the treatment also showed improved score on dyspnea scale after the treatment showed significant difference as p-valve< 0.05.

RESULT:

effect of diaphragmetic stimulation with breathing exercises on clinical respiratory outcomes among patients with respiratory dysfunctiont was determined in this study. By using paired t test analysis that there is a statistically significant improvement p< 0.05 in oxygen saturation rate, respiratory rate, dysnea scale and spirometer variab Eles.

REFERENCES

1. Rehman, A., Amin, F., & Sadeeqa, S. (2018). Prevalence of asthma and its management: A review. JPMA. The Journal of the Pakistan Medical Association, 68(12), 1823-1827.
2. Jones, T. L., Neville, D. M., & Chauhan, A. J. (2018). Diagnosis and treatment of severe asthma: a phenotype-based approach. Clinical Medicine, 18(Suppl 2), s36
3. Shilpa, J. (2019). Patel and Stephen J. Asthma. Pediatrics in Review, 40(11), 549-567.
4. Ding, S., & Zhong, C. (2020). Exercise and asthma. Physical Exercise for Human Health, 369-380
5. Korshøj, M., Lidegaard, M., Skotte, J. H., Krustrup, P., Krause, N., Søgaard, K., & Holtermann, A. (2015). Does aerobic exercise improve or impair cardiorespiratory fitness and health among

cleaners? A cluster randomized controlled trial. Scandinavian journal of work, environment & health, 140-152.

6. Kaminsky, L. A., Imboden, M. T., Arena, R., & Myers, J. (2017, February). Reference standards for cardiorespiratory fitness measured with cardiopulmonary exercise testing using cycle ergometry: data from the Fitness Registry and the Importance of Exercise National Database (FRIEND) registry. In Mayo Clinic Proceedings (Vol. 92, No. 2, pp. 228-233). Elsevier
7. Raghuveer, G., Hartz, J., Lubans, D. R., Takken, T., Wiltz, J. L., Mietus-Snyder, M., ... & American Heart Association Young Hearts Athero, Hypertension and Obesity in the Young Committee of the Council on Lifelong Congenital Heart Disease and Heart Health in the Young. (2020). Cardiorespiratory fitness in youth: an important marker of health: a scientific statement from the American heart association. Circulation, 142(7), e101-e118.
8. Korshøj, M., Lidegaard, M., Skotte, J. H., Krustrup, P., Krause, N., Søgaard, K., & Holtermann, A. (2015). Does aerobic exercise improve or impair cardiorespiratory fitness and health among cleaners? A cluster randomized controlled trial. Scandinavian journal of work, environment & health, 140-152.
9. Santuz P., Baraldi E., Filippone M., Zacchello F.(1997). Exercise performance in children with asthma: is it different from that of healthy controls? Eur Respir J. **10**(6): 1254-60.
10. Pianosi P.T., Davis H.S. (2004). Determinants of physical fitness in children with asthma. Pediatrics. **113**(3 Pt 1): 225-9.
11. 11.Alfaro V., Torras R., Prats M.T., Palacios L., Ibáñez J. (1996). Improvement in exercise tolerance and spirometric values in stable chronic obstructive pulmonary disease patients after an individualized outpatient rehabilitation programme. J Sports Med Phys Fitness. **36**(3): 195-203.
12. 12.Hallstrand T.S., Bates P.W., Schoene R.B. (2000). Aerobic conditioning in mild asthma decreases the hyperpnea of exercise and improves exercise and ventilatory capacity. Chest. **118**(5): 1460-9.
13. 13.Fesharaki M, Omolbanin Paknejad SMJ, Kordi R. (2010). The effects of aerobic and strength exercises on pulmonary function tests and quality of life in asthmatic patients. Tehran University Medical Journal. **68**(6): 348-354.
14. 14.Emtner M, Herala M, Stålenheim G. (1996). Highintensity physical training in adults with asthma. A 10-week rehabilitation program. Chest. **109**(2): 323-30.
15. 15.Yong MS, Lee HY, Lee YS. Effects of diaphragm breathing exercise and feedback breathing exercise on pulmonary function in healthy adults. Journal of physical therapy science. 2017;29(1):85-7