
بسم الله الرحمن الرحيم


وما أوتيتم من العلم إلا قليلا

EFFECT OF ACAPELLA DEVICE ON ACUTE EXACERBATION OF CHRONIC OBSTRUCTIVE PULMONARY DISEASES PATIENTS

تأثير الأكابيلا علي التفاقم الحاد لحالات الانسداد الرئوي المزمن

BY :AHMED HUSSEIN EL DESSOUKY

Acknowledgement

FIRST AND ABOVE ALL, ALL THANKS AND GRATITUDE TO ALLAH THE MOST MERCIFUL, THE MOST COMPASSIONATE, WITHOUT HIS HELP, I COULDN'T HAVE FINISHED THIS WORK.

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LAST BUT NOT LEAST, I WOULD LIKE TO THANK **MY PROFESSORS** AND **DEPARTMENT COLLEAGUES** FOR THEIR SINCERE SUPPORT AND HELP TO FINISH MY STUDY.

SPECIAL GRATITUDE TO **MY FAMILY** FOR THEIR UNCONDITIONAL LOVE, CARE AND SUPPORT DURING THIS WORK COMPLETION AND THROUGHOUT MY LIFE.

statement of the problem

- Did Acapella device have an effect on acute exacerbation of COPD patients?

Purpose of the study

- The purpose was to determine the effect of Acapella on acute exacerbation of COPD patients.

Hypothesis

- Acapella will have no effect on acute exacerbation of COPD.

PATIENTS AND METHODS

PATIENTS AND METHODOLOGY

- **Patients**

40 patients of both sexes with acute exacerbation of COPD (diagnosed by accepted criteria) chest department of Kasr Al Ainy hospital were included in this study. Ages were ranged from 40-60 years old.

Inclusion Criteria

- Patients were diagnosed with acute exacerbation of COPD not in need for ICU admission based on the modified criteria defined in the Global Initiative for Chronic Obstructive Lung Disease **(GOLD, 2013).**

Exclusion Criteria

patients who had met any of these criteria were excluded

- Clinical manifestations of ICT (Intracranial tension).
- Haemodynamic instability.
- Recent facial, oral, or skull surgery or trauma.
- Epistaxis (nose bleeding).

Exclusion Criteria

- Oesophageal surgery.
- Active Haemoptysis.
- Untreated pneumothorax.
- Presence of malignant disease.
- Any significant musculoskeletal disorders.

Ethical consideration

- The purpose, nature and potential risk of the study were explained to all patients.

Instrumentations

- **Evaluating equipment**

Spirometer was used as initial evaluation **(Vitalograph copd-6)** Manufacturer: Vitalograph (Ireland) Ltd, Ennis, Ireland.

Therapeutic equipment

- The Acapella device

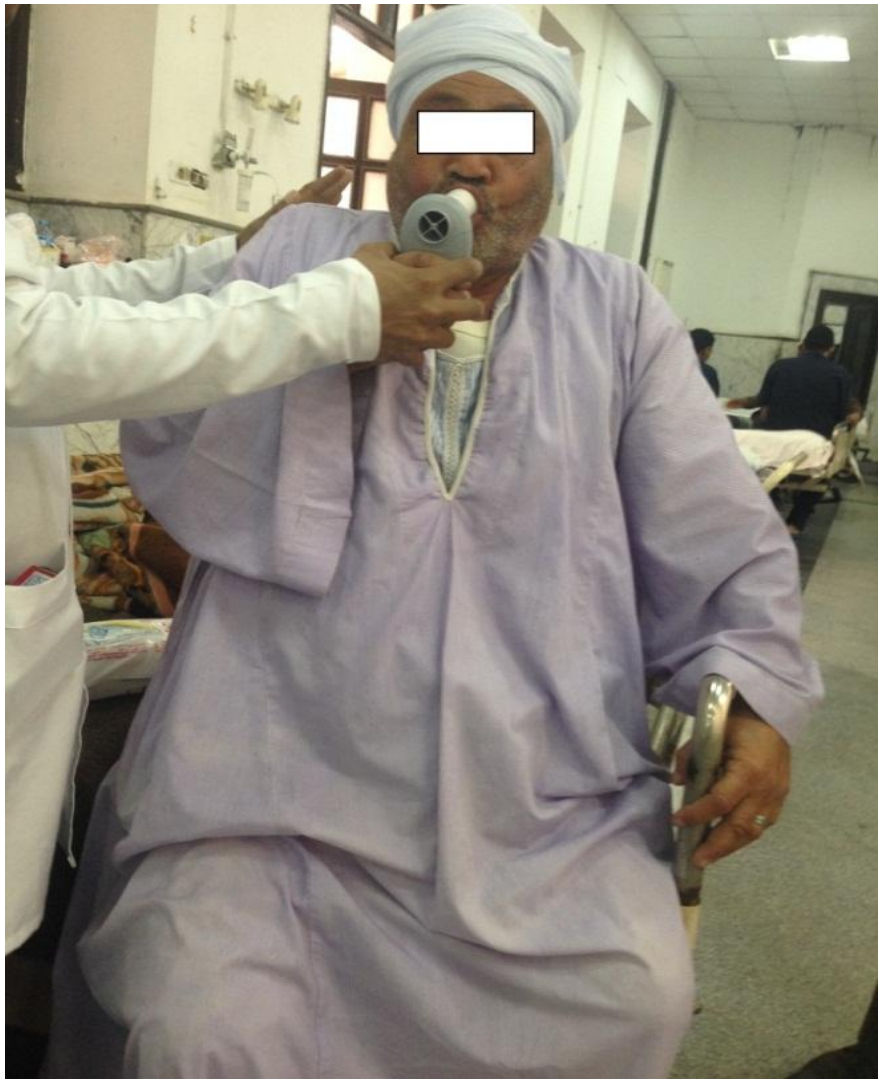
Procedures

- **Evaluation Procedure**

- Verbal explanations about the importance of the study procedures as whole and specifically of the Acapella were given to all patients.
- For each patient before and after the study, spirometry device was used to measure FEV6, FEV1 and FEV1/FEV6

Evaluation Procedure

- (PFT) using Spirometry

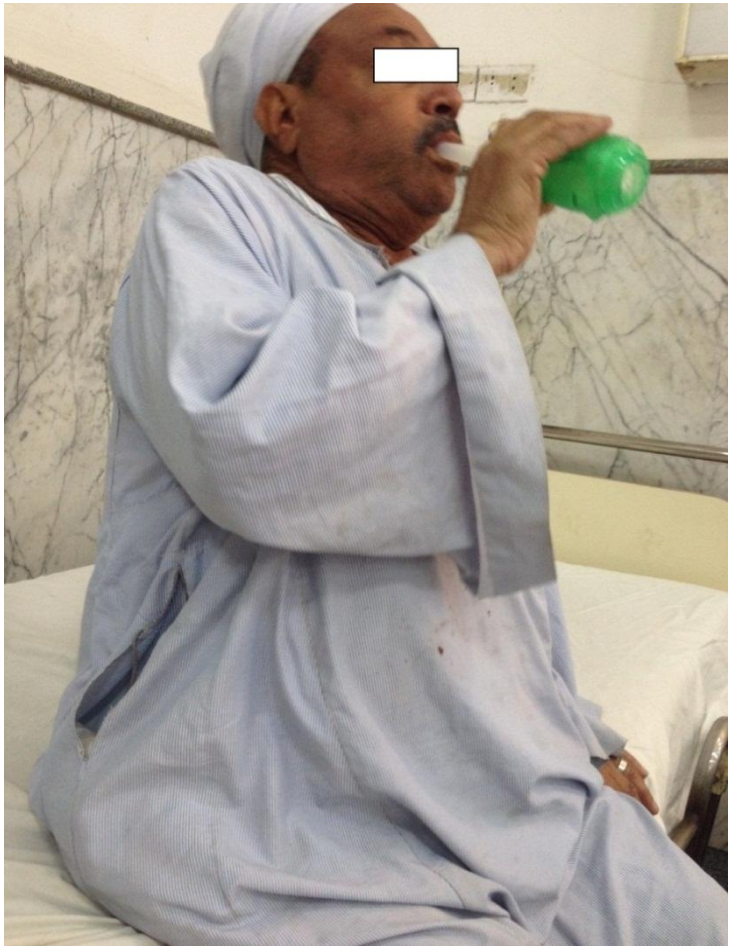


Evaluative procedure

- Spirometer will be used as initial evaluation
  before 10 minutes and Final evaluation after 20 minutes of the session.

Treatment procedure

- Patient performing a treatment session using Acapella device.



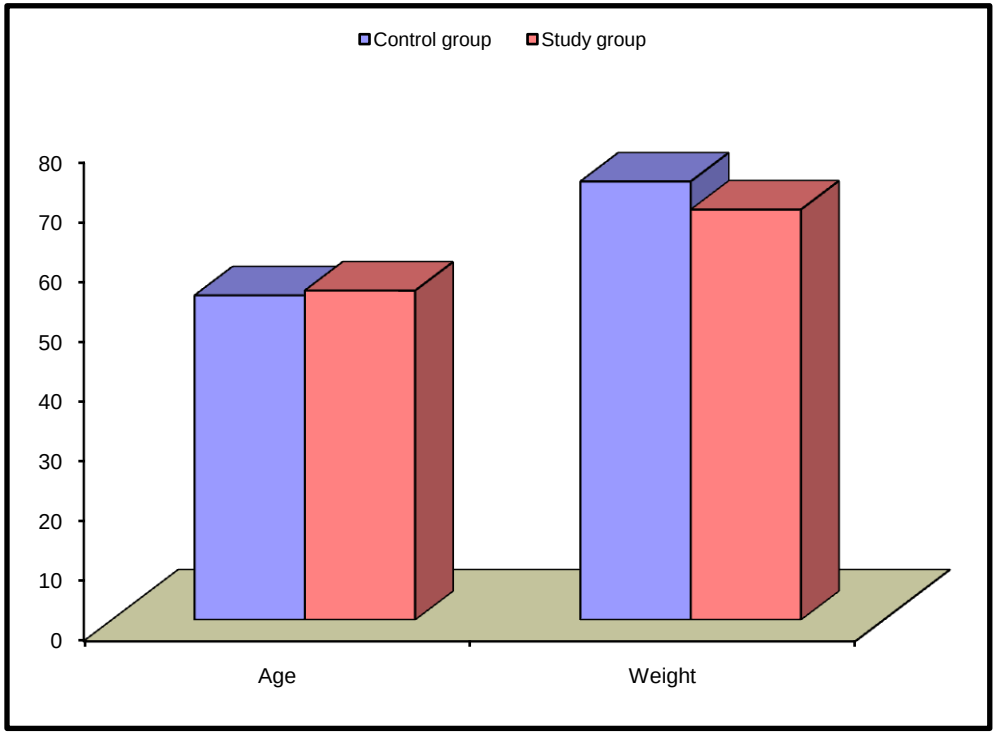
Treatment procedure

- Acapella device combines the principles of high frequency oscillations and positive expiratory pressure by employing a counterweighted lever and magnet. Exhaled gas passes through a cone, which is intermittently occluded by a plug attached to the lever producing airflow oscillations. A knob at the distal end of the device adjusts the proximity of the magnet and counterweighted plug and so adjusting frequency, amplitude, and mean pressure

For group (A) and group (B):

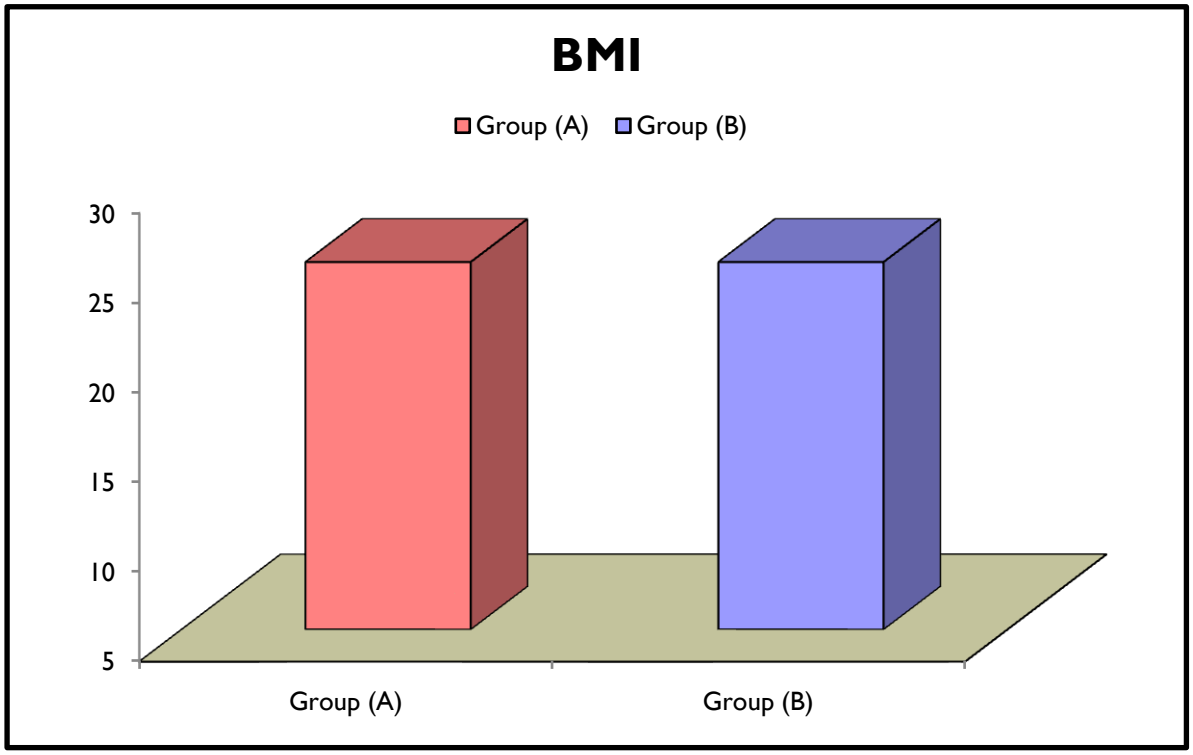
- I-Pursed lip breathing
- II-Percussion
- III-Vibration
- IV-Active cycle of breathing technique
- V-Postural drainage

Results



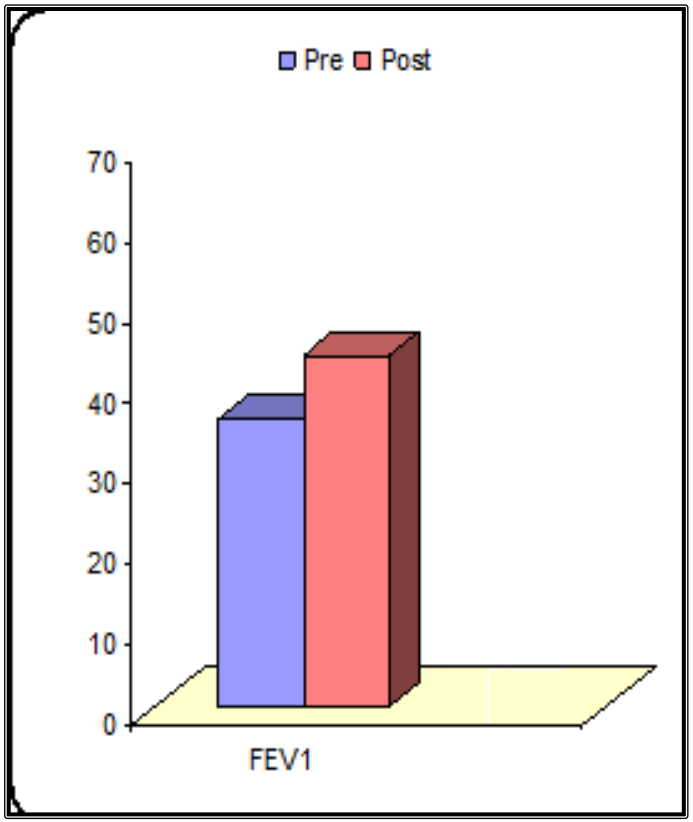
- Figure Show mean of age and weight in study and control group.

Results



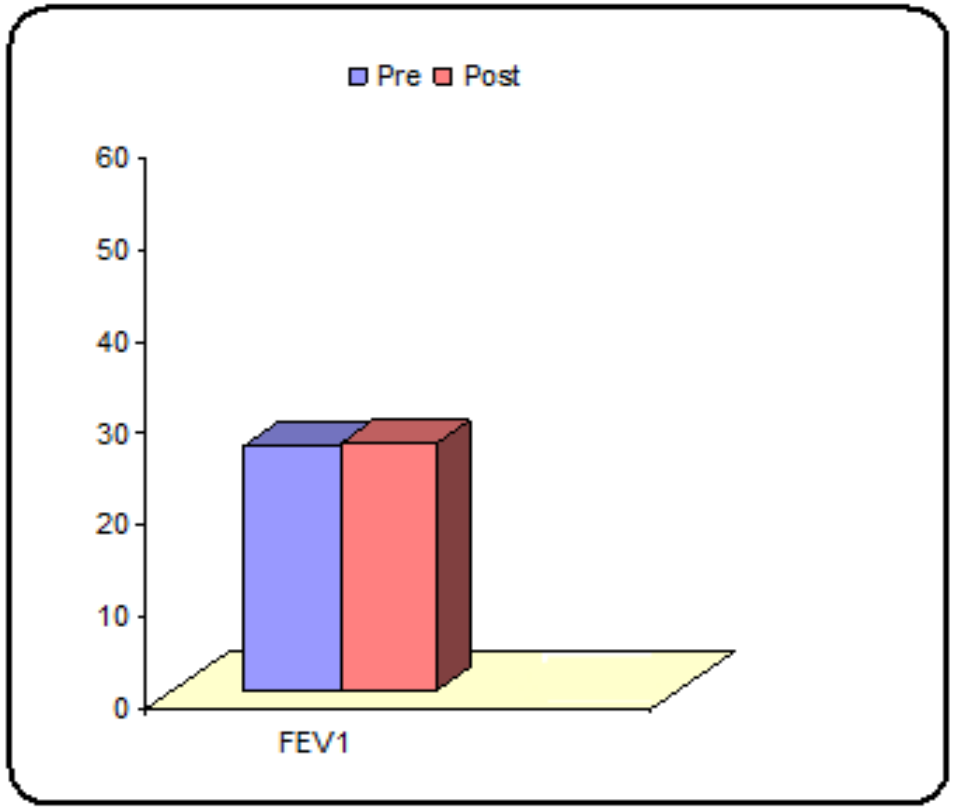
- Figure shows mean of BMI of study and control group

Results



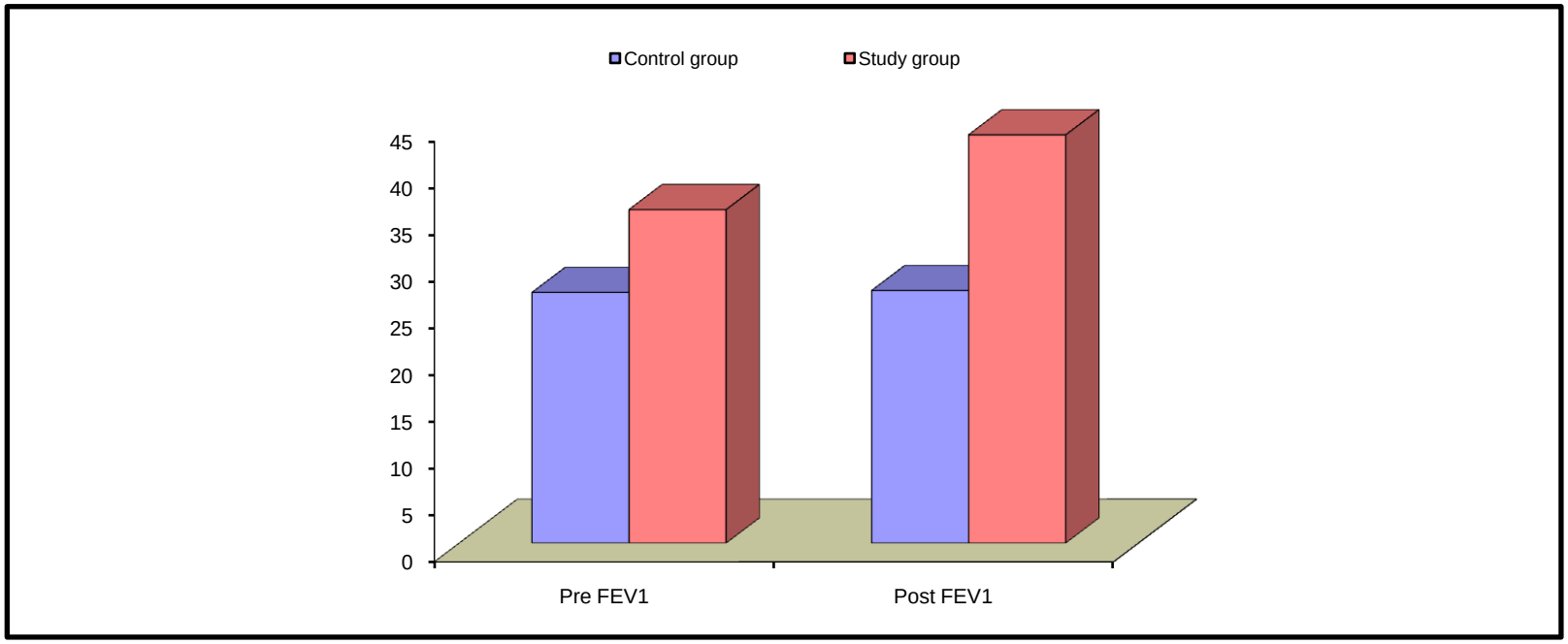
- Figure Shows mean of FEV1 pre and post treatment for group A. showing a statistical highly significant value (P-value =0.000) with a percentage of 8%.

Results



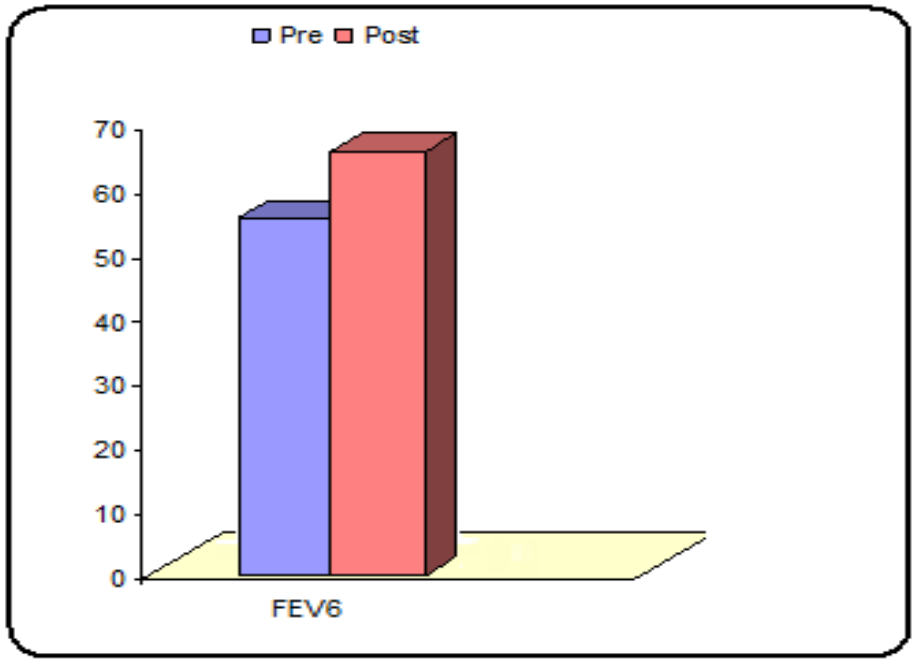
- Figure Shows mean of FEV1 pre and post treatment for group B. %). showing a statistical non-significant value (P-value =0.721) with a percentage of 0.2 %.

Results



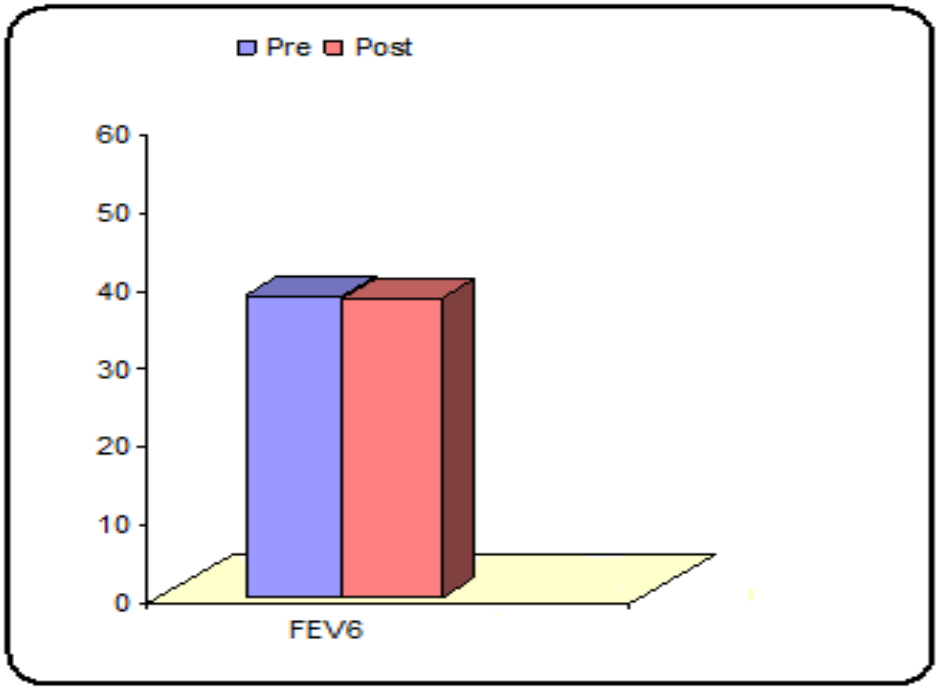
- Figure Shows statistical analysis between group (A) and group (B) for mean values of FEV_1 pre-treatment and post-treatment.

Results



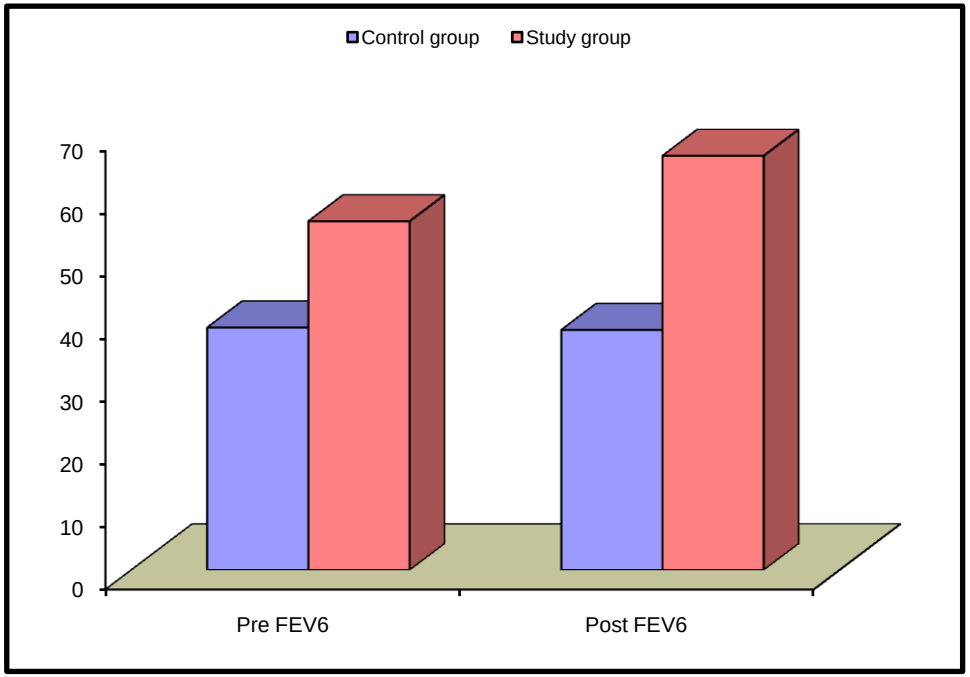
- Figure shows statistical analysis of group (A) for mean values of FEV_6 pre-treatment and post-treatment. and the results showed a statistical highly significant increase (P-value <0.001) with a percentage of 10.45% of improvement

Results



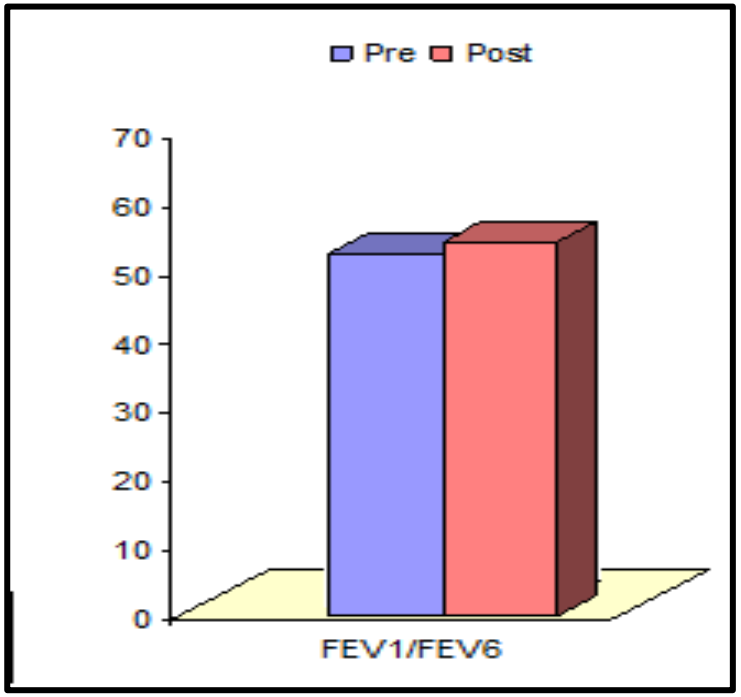
- Figure shows statistical analysis of group (B) for mean values of FEV6 pre-treatment and post-treatment. and the results showed a statistical non-significant increase (P-value >0.05) with a percentage of -0.38% of improvement

Results



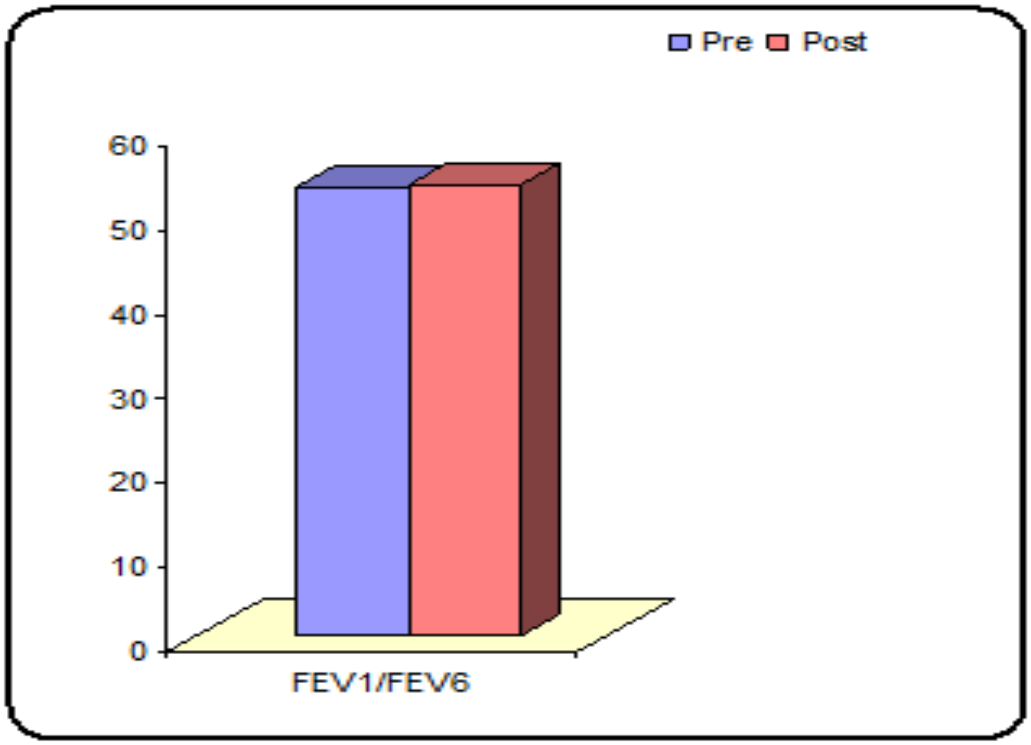
- Figure Shows statistical analysis between group (A) and group (B) for mean values of FEV_6 pre-treatment and post-treatment.

Results



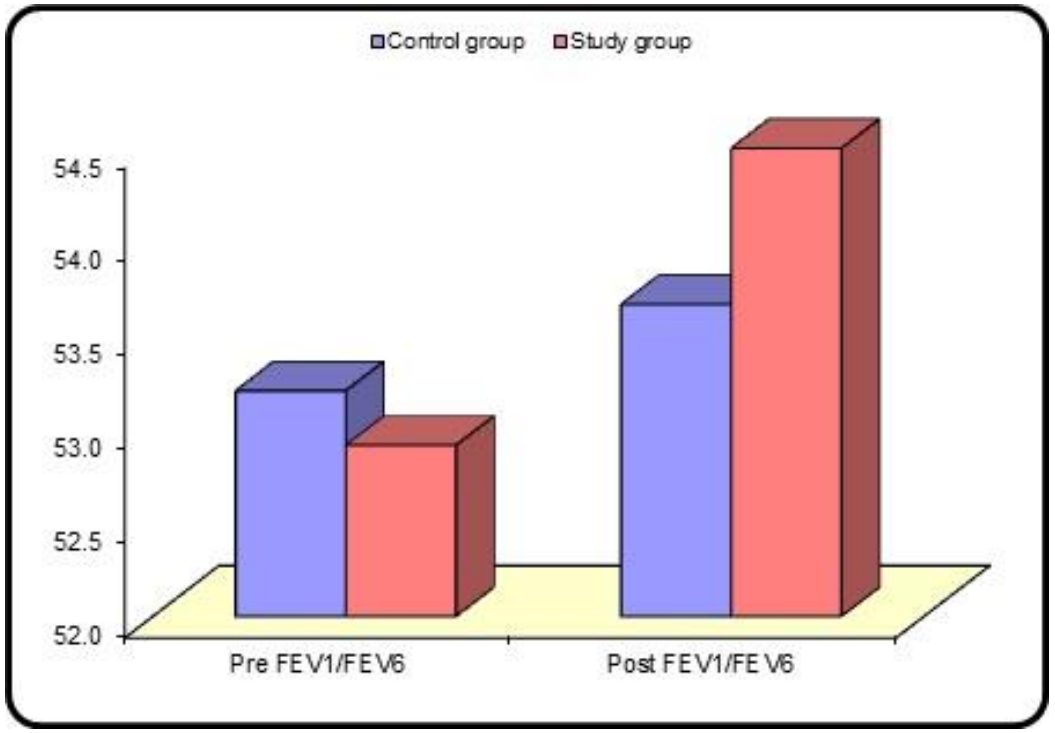
- Figure shows statistical analysis of group (A) for mean values of FEV_1/FEV_6 pre-treatment and post-treatment. The results showed a statistical non-significant increase (P-value >0.05) with a percentage of 1.58% of improvement.

Results



- Figure shows statistical analysis of group (B) for mean values of FEV1/FEV6 pre-treatment and post-treatment. The results showed a statistical non-significant increase (P-value >0.05) with a percentage of 0.46% of improvement

Results



- Figure Shows statistical analysis between group (A) and group (B) for mean values of FEV_1/FEV_6 pre-treatment and post-treatment.

Results

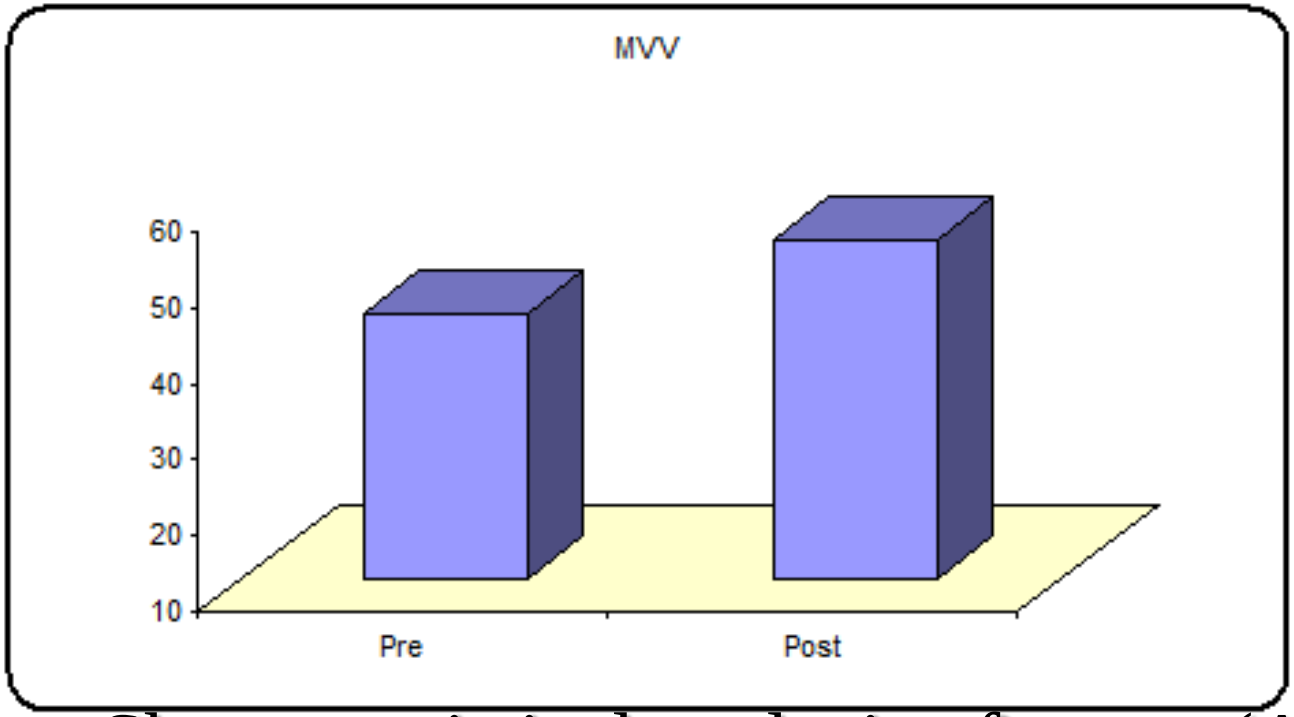
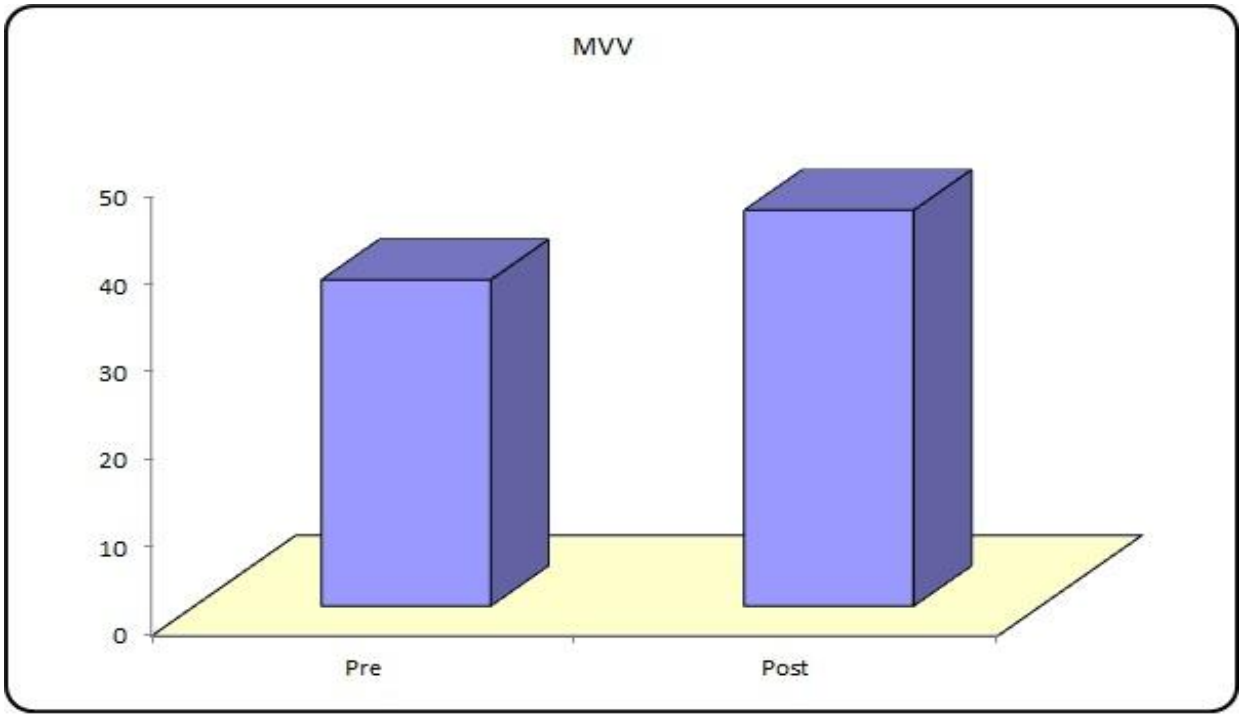


Figure Shows statistical analysis of group (A) (study group) for mean values of MVV pre-treatment and post-treatment with a percentage of 9.69 % of improvement.

Results



- Figure shows statistical analysis of group (B) (control group) for mean values of MVV pre-treatment and post-treatment with a percentage of 7.94 % of improvement.

CONCLUSION

- It was concluded that patients with acute exacerbation of COPD presented with increased dyspnea, amount of sputum production, and fatigue with reduced exercise capacity causing impaired health related quality of life and increased mortality. Therefore, with the achieved beneficial effects of the Acapella device clearance system, it is considered as an effective method improving ventilatory functions for those patients helping them to regain their active life and to be independent in their society as well.

Recommendations

The results of this study considered the following recommendations

- Add the Acapella device to the rehabilitation program in acute exacerbation of chronic obstructive pulmonary disease with posters in the outpatient chest clinics demonstrating its benefit and how it can be used.

Recommendations

More researches will be needed to

- Determine the effect of Acapella device versus flutter device on airway clearance.
- Compare using of high frequency chest wall oscillation (HFCWO) versus Acapella device in chronic respiratory disease.
- Assess the efficacy of Acapella device on the rate of perceived exertion and the six minute walk test in chronic bronchitis patients.

Recommendations

- Assess if the blue Acapella can be beneficial in patients suffering from severe COPD in the acute exacerbation stage.
- Assess the efficacy of Acapella device on patients who suffer from long term exposure to dust, coal mines or other environmental factors.
- Assess the efficacy of devices such as quack or cornet device on airway clearance in patients suffering from acute of COPD.
- Determine the effect of Acapella device on the sputum weight in grams patients with acute exacerbation of COPD.

Recommendations

- Assess if the use of Acapella device can be used in patients who suffer from COPD to reduce or prevent the probability of future exacerbation.
- Assess the effectiveness of Acapella versus Expiration with open glottis in lateral position (ELTGOL) Technique to Promote Airway Clearance in COPD.
- Compare between the use of the Acapella and RC-Cornet for airway clearance in acute exacerbation of COPD.
- Compare between the use of the Acapella and a threshold inspiratory muscle trainer for sputum clearance in acute exacerbation of COPD.


thank you
danke
謝謝
gracias
merci
obrigado
ngiyabonga
teşekkür ederim
go raibh maith agat
mochchakkeram
dziękuję
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