



Effect of Buteyko Breathing Technique on Anxiety and Depression Among COPD Individuals

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(Received: 14 April 2024

Revised: 01 May 2024

Accepted: 18 June 2024)

KEYWORDS

Buteyko Breathing technique, Anxiety, Depression, COPD, SPARS, HDRS 17

ABSTRACT:

Objectives: To study the effect of Buteyko Breathing Technique on anxiety and depression among COPD individuals.

Methods: Sample size of 30 patients was taken based on inclusion and exclusion criteria. Patients were selected via convenient sampling method. Patient who were diagnosed with COPD were included in the study. Patient were excluded based on exclusion criteria. Both males and females were included in the study. Procedure was explained to the patients and pre-test score was taken using SPARS for anxiety and HARD517 for depression. Then patient was asked to do BBT twice daily for 15 min continuously for 5 days and then score of both the questionnaires were taken again on the 5th day. Then pre-test and post-test score was compared.

Results: Comparison of difference of means was done by using paired t-test for two groups. The result of the study was statistically significant.

Conclusion: The present study concludes that BBT has significant improvement in anxiety and depression score among COPD individuals therefore it can be used as a relaxation technique among these patients.

Introduction:

According to WHO, Chronic obstructive pulmonary disease (COPD) is a lung disease characterized by chronic obstruction of lung airflow that interferes with normal breathing and is not fully reversible.¹

Chronic obstructive pulmonary disease (COPD) is characterized by airflow obstruction with breathing-related symptoms such as chronic cough, exertion dyspnea, expectoration, and wheeze. These symptoms may occur in conjunction with airway hyperresponsiveness and may be partially reversible. There is airflow limitation which is not fully reversible.²

The airflow limitation is usually progressive and is associated with an abnormal inflammatory response of the lungs to noxious particles or gases, primarily caused by cigarette smoking.

Although COPD affects the lungs, it also produces significant systemic consequences.³

Airflow limitations is the slowing of expiratory airflow as measured by spirometry, with a persistently low forced expiratory volume in 1 second (FEV1) and a low FEV1/forced vital capacity (FVC) ratio despite treatment.⁴ The GOLD definition for airflow limitation is an FEV1/FVC ratio of less than 70%.



Depression is a frequent mental comorbidity seen in COPD with prevalence estimate clinical samples ranging from 15% to 40%.⁵

Dyspnea as one of the co symptom of COPD may play an important role in the causal relationship between COPD and depression. Psychological and emotional states also alter respiratory control and respiratory rhythm generation. Subsequently changes in breathing pattern which can be dysfunctional are very common in people under psychological stress.⁵

Depression causes changes in a person's mood, and feelings and symptoms of sadness, fatigue, anxiety, sleep and appetite disturbances, difficulty in concentrating, feelings of hopelessness, restlessness, or decreased activity, loss interest in usual activities, aches and pains with no medical cause and finally thoughts of death and suicide.⁶

Another important symptom and problem associated with depression is hyperventilation. Hyperventilation of lungs makes the diaphragm shorten so that it loses its ability to lift and widen ribcage, understandably, this contributes to feeling of not being able to take breath leading to early fatigue follow a cycle of dependency based on hyperventilation.⁷

Breathing retraining has positive effect on anxiety and panic disorders as these patients' manifest hyperventilation as a symptom.⁷

Buteyko is breathing technique discovered by Konstantin Pavlovich Buteyko. The Buteyko Breathing method is a unique breathing therapy that uses breath control and breath holding.⁸

Buteyko Breathing Technique involves three steps : Nasal breathing, Breath control exercises, Relaxation.⁸

There are various relaxation exercises showing effects on depression and anxiety while Buteyko Breathing has shown positive effects on dyspnea, depression, anxiety, panic attacks, and stress in wide range of health-related conditions.⁹

There is no evidence showing the effects of Buteyko breathing technique on depression and anxiety among COPD population. Therefore, this study has been done to deal with the issues of anxiety and depression in stable COPD subjects which will help COPD subjects to

involve more in pulmonary rehabilitation thus helps in improving their quality of life.

Methodology

The study design was experimental study and sampling criteria was convenient sampling, which was done in Chest ward of HIHT, Jolly grant, Dehradun.

The selection criteria included:

Inclusion criteria-

- Stable COPD patients
- Both males and females were included
- HDRS17 > 7 score
- Sheehan Anxiety score > 10.

Exclusion criteria-

- COPD patients who were on NIV support
- Patients with recent chest trauma
- Patients who are unable to understand and follow the command.

Procedure

- The subjects were informed regarding the purpose and procedure of the study and the consent form for the same was taken.
- Then both the questionnaires were filled and then the exercise was demonstrated to the subjects .
- There were 2 sessions/day for 15 minutes one in the morning and the other was held in the afternoon.
- The sessions were continued for 5 days and on 5th day, the above-mentioned questionnaires were filled again.
- Subject was positioned straight in sitting and then exercises were demonstrated
- Subject was asked to do normal inhalation and exhalation and 2-3 repetitions were done.
- Then subject was asked to do quiet inhalation and exhalation 4-5 repetitions.
- The Control Pause time of the patient was noted.

Data Analysis

Statistical analysis for the present study was done using statistical package for social sciences version 22 (SPSS). Descriptive statistics was calculated for quantitative variable, frequency along with percentage was calculated for qualitative and categorical variables. Outcome measures included SPARS and HDRS17 for measuring anxiety and depression by obtaining pre intervention score and post intervention score. Comparison of



difference of means was done by using paired t-test for two groups. If $p < 0.05$ it was statistically significant.

Result

The result was highly significant with p value less than 0.05%.

The Pre-test and Post-test score of HDRS17 scale for depression showed that the treatment was clinically significant with p value < 0.000 . This indicated that there was significant improvement in depression.

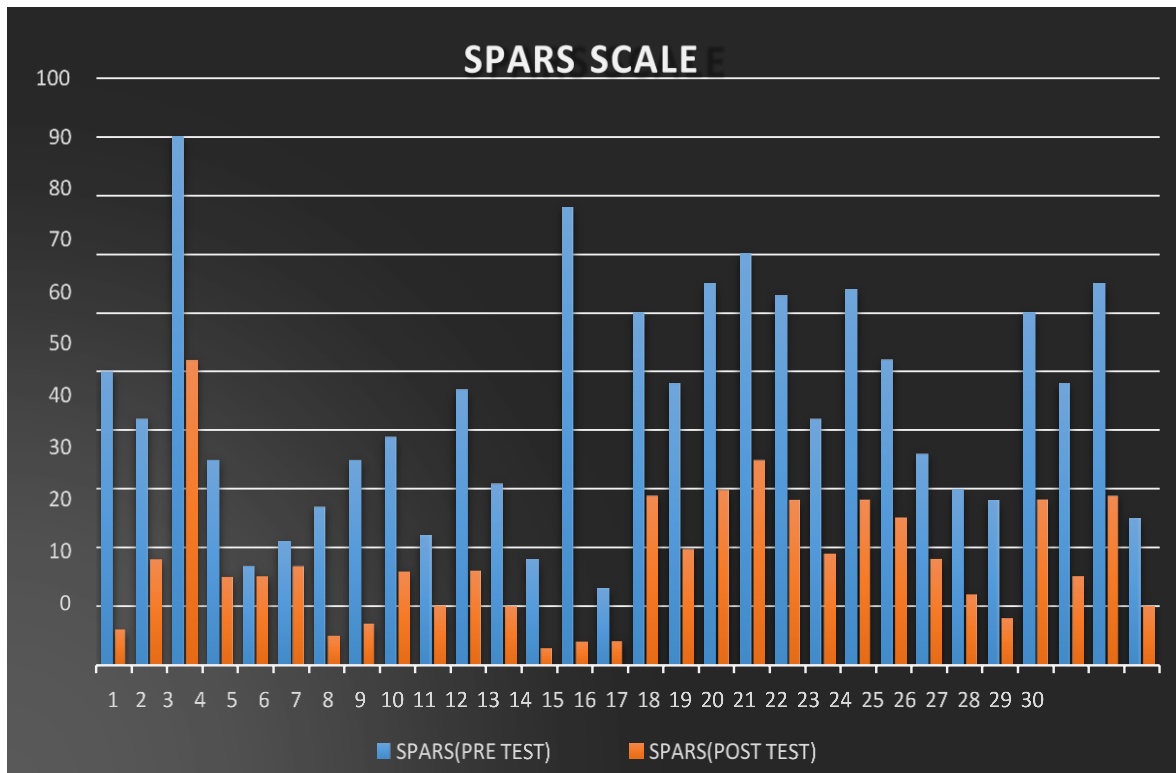
Pre-test and Post-test score of SPARS showed that the treatment was highly significant with p value < 0.001 .

Table 1 Shows the Mean And Standard Deviation Of Spars Pre Test And Post Test Score Along With The Difference In Their Mean And P-Value < 0.001 Which Was Statistically Significant

| VARIABLE | N | MEAN | SD |
|-------------------------|----|-------|--------------|
| SPARS(PRE-TEST SCORE) | 30 | 44.03 | ± 19.611 |
| SPARS (POST TEST SCORE) | 30 | 17.73 | ± 11.138 |

| VARIABLE | MEAN | SD | P-VALUE |
|----------|------|----|---------|
|----------|------|----|---------|

GRAPH 1 Shows Spars Pre Test And Post Score



GRAPH 2 Shows Pre-Test And Post-Test Score Of Spars With The Mean 44.03 ± 19.611 And 17.73 ± 11.138 Which On Comparing The Pre-Test And Post-Test Score Of Spars Gives The Mean Value 26.300 ± 13.654 Which Shows That The Treatment Is Highly Significant With P Value < 0.001 .

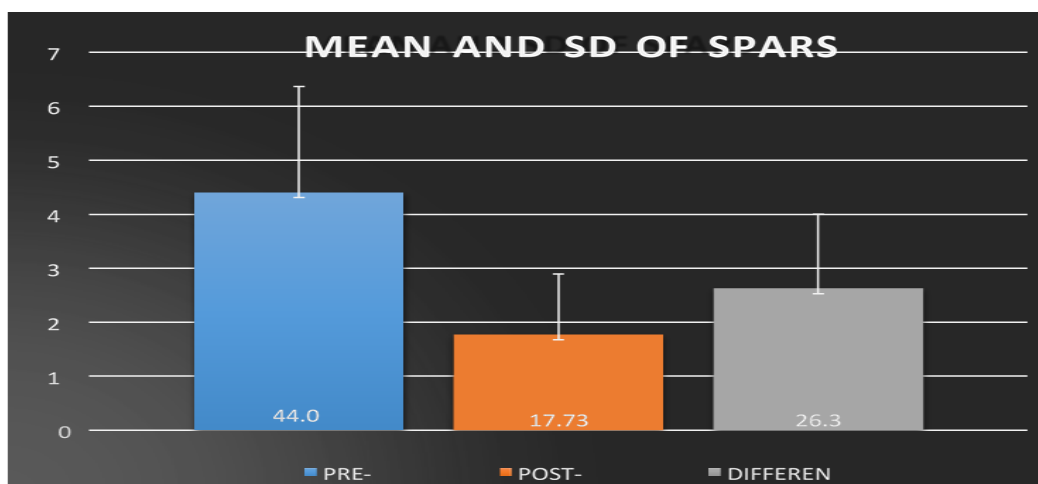
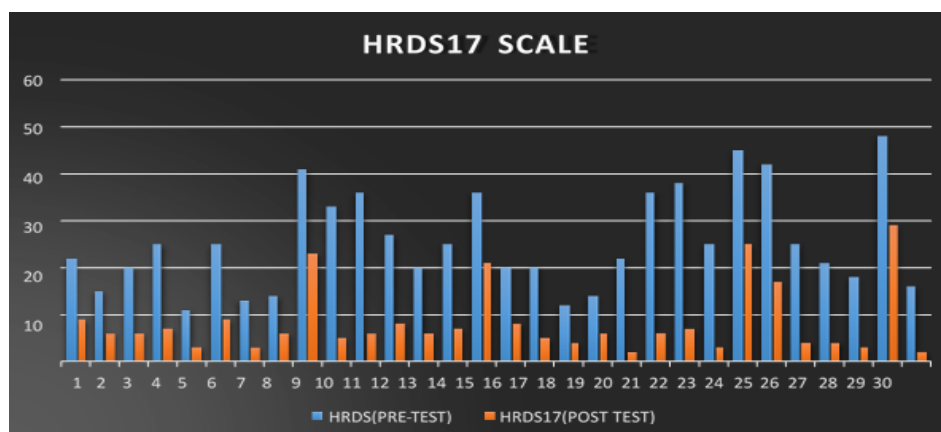


TABLE 2 Shows the Mean And Standard Deviation Of Hdrs17 Pre Test And Post Test Score Along With The Difference In Their Mean And P-Value <0.000 Which Was Statistically Significant

| VARIABLE | N | MEAN | SD |
|-------------------------|----|-------|---------|
| HDRS17 (PRETEST SCORE) | 30 | 25.50 | ±10.474 |
| HDRS17(POST TEST SCORE) | 30 | 8.33 | ±7.126 |

| VARIABLE | MEAN | SD | P-VALUE |
|--------------------------------|--------|-------|---------|
| DIFFERENCE IN SCORING (HDRS17) | 17.167 | 6.711 | 0.000 |

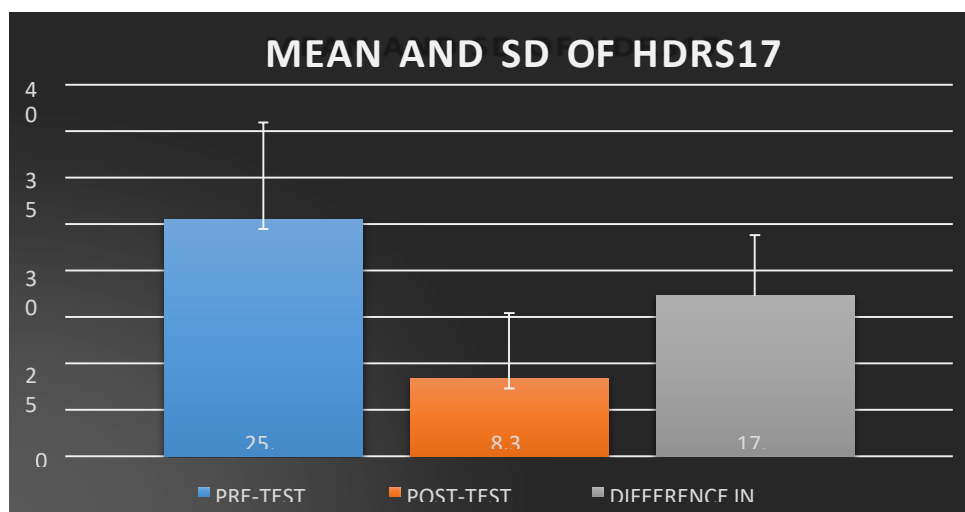
GRAPH 3 Shows HDRS 17 Pre-Test and Post Score



GRAPH 4 Shows Pre-Test And Post-Test Score Of Hdrs17 With The Mean 25.50 ±10.474 And 8.33±7.126 Which On Comparing The Pre-Test And Post-Test Score Of Hdrs17 Gives The Mean Value 17.167 ±6.711 Which Shows That The



Treatment Is Highly Significant With P Value <0.000 Among Depression Patients



Conclusion

The present study concluded that the pretest and post test score obtained in SPARS showed significant improvement in anxiety and the score obtained in HDRS17 before and after intervention also showed highly significant improvement in depression. Thus, Buteyko Breathing Technique has a positive effect on anxiety and depression among COPD individuals.

Discussion:

From the Statistical Analysis, it was seen that BBT is effective in treating anxiety and depression among COPD individuals.

This study included total number of 30 individuals among which 50% were males and 50% were females with mean age of 56.00 ± 7.105 who were given intervention in the form of BBT daily for 5 days (twice daily).

While there are many instruments present to measure anxiety and depression. We used SPARS to measure anxiety which was considered a valid and reliable instrument to measure anxiety. To check the depression in our study we used HDRS17 as a measuring instrument.

According to review article and meta-analysis (Abew M. Yohannes et al. study done in USA, 2013) concluded that under recognized and untreated depression and anxiety symptoms have deleterious effects on physical functioning and social interaction increasing fatigue and healthcare utilization in patients with COPD.¹⁰

According to Michael Schuler et al. in 2018 concluded in his study Dyspnea and Depression seem to be interrelated through a variety of different pathways in COPD patients. Dyspnea as one of the core symptoms of COPD may play an important role in the casual relationship between COPD and Depression.¹¹

Cross sectional and longitudinal studies demonstrated that worse dyspnea is related to higher depression symptoms (Al-Papaioannou et al., 2012).¹²

There is frequent co-occurrence of anxiety and depression. According to study done by Judy Garber et al. it causes hyperventilation which leads to hyperinflation of lungs. Depression also causes hyperventilation which leads to hyperinflation of lungs. The hyperinflation of lungs shortens the diaphragm such that it loses its ability to lift and widen the rib cage. The production of hyperinflation by any means makes the muscles of breathing function more efficiently and causes a significant decrease in the symptoms of breathlessness.⁷

According to Buteyko teachings, hypocapnia leading to hyperventilation is widespread and generally unrecognized destabilizer of physiological systems and psychological states. It is also a type of breathing retraining which helps to alleviate symptoms caused by dysfunctional breathing and hyperventilation because breathing retraining is useful to normalize each pattern of breathing.⁹



People practicing the BBT are taught to reduce their value of breathing by using a combination of increased abdominal muscle tone and relaxation of all muscles of breathing and improves function of diaphragm. ⁷ One essential function of CO₂ is to maintain the body's acid base balance and any change in this balance can have a massive effect on muscle function, pain perception and emotional liability.¹³ Professor Buteyko and others point to the loss of Carbon Dioxide (CO₂), there is clear evidence that low CO₂ plays a role in bronchoconstriction and many other types of physiological dysfunction.¹⁴ Studies have proved that Carbon Dioxide relaxes smooth muscle which surrounds airways, arteries, and capillaries.¹⁵ Therefore, this study has a much wider impact on anxiety and depression patients which can further improve their quality of life.

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