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MIND OVER BREATH: A STUDY ON MINDFULNESS MEDITATION AND BREATHING EXERCISES IN MITIGATING DYSPNOEA, FATIGUE AND RESPIRATORY PARAMETER AMONG COPD PATIENTS

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Abstract

Background: The present study aims to determine the efficacy of Mindfulness meditations and breathing exercises potential to decrease the level of dyspnea, perceived fatigue, and respiratory parameters among patients with COPD at Saveetha Medical College and Hospital, Thandalam. **Methods:** An experimental pre-test and post-test design was followed in this study. The purposive sampling technique was used to select the sample who met the inclusion criteria in each group 30 in the experimental group and 30 in the control group. The demographic and clinical data were collected by using a standardized questionnaire. Dyspnea and fatigue scales were used for pre-and post-testing, and respiratory parameters were also recorded. The mindfulness meditation was administered for 10 minutes followed by a breathing exercise administered among the patients with COPD for 20 minutes which consisted of 4 exercises such as slow and deep breathing, active expiration, pursed-lip breathing diaphragmatic breathing (DBE) 5 to 10 minutes, and it was carried out once a day for 7 days. On the 7th day, the post-test was conducted using the same tools. Data was gathered by using structured questionnaires. Collected data were analyzed by using descriptive and inferential statistics. **Results:** The experimental group's dyspnea pre-test mean score was 23.23±8.21, and its post-test mean score was 16.36±6.60. 6.87 was the mean difference score. At the $p<0.001$ level, the computed paired t-test result of 11.823 was found to be statistically significant. The control group's mean tiredness score before the test was 32.70±11.26, and after the test, it was 32.93±11.23. The score for the mean difference was 0.23. At the $p<0.05$ level, the computed paired test result of $t = 1.651$ was not statistically significant. **Conclusion:** The study results infer that mindfulness meditation and breathing exercises on dyspnea, and perceived fatigue among patients with COPD were found to be effective in improving respiratory parameters, and SpO2 among patients with COPD.

Keywords: Mindfulness**,** Breathing Exercise, Level of Dyspnea, Perceived Fatigue, Respiratory Parameters, and COPD Patients.

INTRODUCTION

Chronic obstructive pulmonary disease (COPD) is a prevalent chronic respiratory condition which causes symptoms to gradually deteriorate. Although it is preventable, once it begins, it cannot be cured; nevertheless, good self-management strategies may decrease the burden of disease and improve quality of life.(1) One frequent lung

condition that causes breathing difficulties and reduced airflow is chronic obstructive pulmonary disease, or COPD. It is among the most prevalent potentially fatal illnesses impacting people on a worldwide scale. With 3.23 million fatalities from chronic obstructive pulmonary disease (COPD) in 2019, it ranks as the third most common cause of mortality globally.[2] An review of multiple demographic studies in India revealed that, on average, 82.3 percent of male patients had COPD and that smoking was associated with the disease. COPD patients have increased work of breath and dyspnea as a result of pathophysiological changes in the airway, tissue, and vascular supply to the lungs. These changes also increase airway resistance and air trapping and impair lung compliance.[3]

Patients with COPD frequently avoid or restrict physical activity to prevent dyspnea; this lowers exercise tolerance and increases anxiety, impairment, and a lower quality of life (QoL).[4] Although COPD cannot be cured, symptoms can lessen if a person stops smoking, protects themselves from air pollution, and receives vaccinations to fend off infections. Additionally, oxygen, medications, and pulmonary rehabilitation can be used to treat it. [5] Numerous research have examined the frequency of weariness in individuals with COPD; however, variations in study methodology have produced inconsistent findings. Important variables include co-morbidities, the degree and stability of the disease, the interval between exacerbations, and variations in the evaluation of weariness.[6]

In today's world, fatigue is defined as the subjective sense of being worn out or exhausted is a prevalent complaint. It's a significant, bothersome, and enduring symptom of numerous chronic illnesses, such as Chronic Obstructive Pulmonary Disease (COPD). Estimates of the prevalence of mild-to-severe weariness in COPD patients range from 47% to 72%. After dyspnea, fatigue is thought to be the most severe symptom of COPD. It substantially reduces a patient's quality of life (QoL) and functional performance.[7]

A new strategy plan called Rehabilitation 2030 aims to improve and enhance rehabilitation services throughout health systems. The Package of Interventions for Rehabilitation, which is presently being developed as part of this WHO project, includes pulmonary rehabilitation for COPD patients.[8] For COPD patients, mindfulness mediation and breathing exercises (BE) are crucial components of an all-encompassing pulmonary rehabilitation program. Mindfulness meditation was used for the patients for 10 minutes followed by the BE. Patients with COPD can benefit greatly from mindfulness mediation techniques and breathing exercises help them control their symptoms. By enhancing awareness of their breathing patterns and fostering relaxation, mindfulness can help reduce dyspnea and perceived fatigue. Incorporating these practices into COPD management plans may improve patients' overall quality of life.[9]

Many forms of BE have been prescribed to reduce lung hyperventilation, improve respiratory muscle function, exercise tolerance, and quality of life (QoL) in patients with COPD. These include diaphragmatic breathing (DBE), pursed-lip breathing (PLB), slow and deep breathing, active expiration, relaxation breathing, and ventilatory feedback (VF) training. These breathing exercises can be done on their own or in conjunction with other forms of BE. A crucial element of pulmonary rehabilitation programs, exercise prescription is a non-pharmacological strategy to controlling

COPD. A substantial body of research supports the advantages of pulmonary rehabilitation for COPD patients. [10]

Exercises that build strength and endurance are recommended for those with COPD. A key component of the worldwide lung rehabilitation program for patients with COPD is breathing exercise. This includes training in breathing techniques (diaphragmatic breathing, pursed-lip breathing, whole-body breathing exercises, etc.) and strengthening the breathing muscles (inspiratory and expiratory muscle training)[11]. Breathing exercises can significantly increase patients' initiative and compliance because they are easy to use, don't demand a lot of capital, and don't have any site limits like other treatment approaches do.

Breathing exercises have been shown in an increasing number of studies in recent years to improve lung function and dyspnea, boost exercise endurance, and enhance the quality of life for COPD patients.[12] The growth of evidence-based medicine has led to an annual increase in systematic reviews (SRs) of breathing exercises for COPD patients; yet, the reports' quality varies, making clinical decision-making by researchers extremely difficult. For instance, inspiratory muscle training (IMT) was found to increase exercise tolerance, dyspnea, and respiratory muscle strength and endurance in individuals with COPD.[13] IMT, however, it was found to improve inspiratory muscle strength, functional capacity, and pulmonary function without affecting dyspnea or quality of life .[14] As a complete treatment program, pulmonary rehabilitation (PR) aims to enhance the physical and mental health of patients with chronic lung disorders by developing a customized treatment plan for each patient based on a thorough assessment of their overall state. An increasing number of people are becoming interested in its use in clinical treatment.[15] Hence the present study investigated the efficacy of Mindfulness meditations and breathing exercises potential to decrease the level of dyspnea, perceived fatigue, and respiratory parameters among patients with COPD.

Objectives of the study:

1. To assess and compare the level of dyspnea, fatigue, oxygen saturation, and respiratory rate among patients with COPD in the experimental and control group.
2. To assess the efficacy of Mindfulness meditation and breathing exercise on dyspnea, fatigue, oxygen saturation, and respiratory rate among patients with COPD in the experimental group and comparison in the control group.

Hypothesis: There is a significant difference between the pretest and posttest level of dyspnea, fatigue, and respiratory parameters after the administration of Mindfulness meditation and breathing exercise among patients with COPD.

Ethics Committee Approval: The study protocol was approved by The Institutional Scientific Review Board under the Saveetha College of Nursing (007/02/2023/ISRB/SCON dated 05th December-2022). The study was conducted in accordance with the principles of the Declaration of Helsinki.

METHODS AND MATERIALS

Study design: The research approach used in this study was quantitative approach. An experimental pre-test and post-test design was followed in this study. The study was conducted at the Saveetha Medical College and Hospital, Thandalam, Chennai-105. All COPD patient with dyspnoea and fatigue considered as an accessible

population. Permission was obtained from the hospital authority Saveetha Medical College and Hospital to conduct the study. This study was conducted for the duration of one month of March 15, 2023 to April 15, 2023 in the selected Hospital. The purposive sampling technique was used to select the sample who met the inclusion criteria in each group 30 in the experimental group and 30 in the control group. Informed consent was translated into the Tamil language. Study participants received the information on the purpose of the study and after clarifying their doubts, written informed consent was taken from them in both experimental and control groups for their participation in the study. Followed the ethical principles and adhered to protect the rights of the participants. Confidentiality of the data was ensured and no risk was encountered throughout the study. There are four sections in Data Collection Tools. Section; A - Demographic variables were collected by using a structured questionnaire. **Section- B** clinical variables such as respiratory rate, saturation, blood pressure, etc., Section - C Modified Medical Research Council (mMRC) dyspnea Scale [15] tool was used to assess the level of dyspnea, Section – D The Manchester COPD Fatigue Scale (MCFS) [16] was used to assess the level of fatigue among the COPD Patient. To measure the degree of exhaustion, the 27-item MCFS self-reported measure combines characteristics of the physical (11 items), cognitive (7 items), and psychosocial (9 items) domains. The pre-test was carried out on 1st day and the dyspnea, fatigue, and respiratory parameters were measured by using the dyspnea scale, fatigue scale, and respiratory parameters by clinical method. After that, mindfulness meditation was administered for 10 minutes followed by that breathing exercise was administered among the patients with COPD for 20 minutes which consisted of 4 exercises such as slow and deep breathing, active expiration, pursed-lip breathing (PLB) 5 to 10 minutes, relaxation breathing and followed by diaphragmatic breathing (DBE) 5 to 10 minutes, and it was carried out once a day for 7 days. On the 7th day, the post-test was conducted using the same tools. Each sample took approximately 25 to 30 minutes to complete the data collection.

Analysıs: The data were analyzed by descriptive and inferential statistical methods using IBM SPSS version 22.0 software (IBM Corp., Armonk, NY, USA) statistical package. The demographic and obstetric data were analysed by frequency and percentage. Mean and standard deviation was used to assess the maternal and foetal parameters. The probability of $p<0.05$ or less was taken as statistically.

RESULTS AND DISCUSSION

The frequency and percentage distribution of the demographic variables of the COPD patients in the experimental and control groups show that the majority of the patients were between the ages of 46 and 55, with 19 (63.3%) in the experimental group and 16 (53.3%) in the control group being male. Additionally, 26 (86.7%) in the experimental group and 24 (80%) in the control group were married, 18 (60%) in the experimental group and 16 (53.35) in the control group having higher secondary education, 12 (40%) in both groups being moderate workers, and 21 (70%) in the experimental group and 19 (63.4%) in the control group were residing in a semi-urban area,25 (83.3%) of the experimental group and 23 (76.7%) of the control group had a family history of COPD, while 23 (76.7%) of the experimental group and 21 (70%) of the control group had the condition for less than six months.

The pretest results showed that 17 (56.7%) of the 30 COPD patients in the experimental group had moderate dyspnea, 9 (30%) had severe dyspnea, and 4

(13.3%) had mild dyspnea. The post-test results showed that 17 (56.7%) had mild dyspnea, 10 (33.3%) had moderate dyspnea, and 3 (10%) had severe dyspnea. In contrast, 18 (or 60%) of the control group's participants experienced moderate dyspnea, 9 (30%) had severe dyspnea, and 3 (10%) had mild dyspnea in both the pretest and post-test. (Table & Figure 1)

Table 1: Frequency and percentage distribution of pretest and post-test levels of dyspnea among patients with COPD in the experimental and control group. N = 60(30+30)

Level of Dyspnea	Experimental Group				Control Group			
	Pretest		Post Test		Pretest		Post Test	
	F	%	F	%	F	%	F	%
Mild (0 -13)	4	13.3	17	56.7	3	10.0	3	10.0
Moderate (14 – 26)	17	56.7	10	33.3	18	60.0	18	60.0
Severe (27 – 40)	9	30.0	3	10.0	9	30.0	9	30.0

In the pretest, 19 (63.4%) of the experimental group reported having moderate fatigue, 7 (23.3%) had severe exhaustion, and 4 (13.3%) had mild fatigue. In the posttest, 18 (60%) reported having mild fatigue, 9 (30%) had moderate fatigue, and 3 (10%) had severe fatigue. This is shown in Table 2. In contrast, 21(70%) had moderate fatigue, 6(20%) had severe exhaustion, and 3(10%) had mild fatigue in the post-test while 20(66.7%) in the control group had moderate fatigue, 6(20%) had severe fatigue, and 4(13.3%) had light fatigue in the pretest. (Figure 2)

Table 2: Frequency and percentage distribution of pretest and post-test levels of respiratory rate among patients with COPD in the experimental and control group. N = 60(30+30)

Level of Respiratory Rate	Experimental Group				Control Group			
	Pretest		Post Test		Pretest		Post Test	
	F	%	F	%	F	%	F	%
Abnormal (<18)	28	93.3	0	0	28	93.3	26	86.7
Normal (18 – 22)	2	6.7	30	100.0	2	6.7	4	13.3

Table 2 above demonstrates that in the experimental group's pretest, 28 (93.3%) had aberrant respiration rates, 2 (6.7%) had normal respiratory rates, and 30 (100%) had normal oxygen saturation levels in the post-test. In contrast, in the control group's pretest, every single one of the thirty (100%), twenty-eight (93.3%), and two (6.7%) had abnormal respiratory rates; in the post-test, 26(86.67%) had abnormal respiratory rates, and four (13.3%) had normal respiratory rates.

Table 3: Frequency and percentage distribution of pretest and post-test level of SPO_2 among patients with COPD in the experimental and control group. N = 60 (30+30)

Level of SPO_2	Experimental Group				Control Group			
	Pretest		Post Test		Pretest		Post Test	
	F	%	F	%	F	%	F	%
Abnormal (<95%)	30	100.0	16	53.3	30	100.0	30	100.0
Normal (95 – 100)	0	0	14	46.7	0	0	0	0

The above table 3 shows that in the pretest of experimental group, 30(100) had abnormal oxygen saturation and in the post test, 16(53.3%) had abnormal oxygen saturation level and 14(46.7%) had normal oxygen saturation level, Whereas in the

pretest and post test of control group, all 30(100%) had abnormal oxygen saturation level.

Effectiveness of Mindfulness Meditation breathing exercise on dyspnea, fatigue, oxygen saturation and respiratory rate among patients with COPD in the experimental group and comparison in the control group

According to Figure 3, the experimental group's dyspnea pre-test mean score was 23.23±8.21, and its post-test mean score was 16.36±6.60. 6.87 were the mean difference score. At the p<0.001 level, the computed paired "t-test value" of t = 11.823 was statistically significant. The post-test results indicate a statistically significant difference in the post-test level of dyspnea between the two groups, with a p-value of less than 0.001, as indicated by the calculated student independent "t" test value of t = 3.916. The calculated student independent 't' test value of t = 3.916 in the post test shows that there was statistically significant difference between the post test level of dyspnea between the two groups which was statistically significant at p<0.001 level. This demonstrates unequivocally that the degree of dyspnea among COPD patients was considerably decreased in the experimental group following the administration of breathing exercises.

Table 4: Effectiveness of breathing exercise on fatigue among patients with COPD in the experimental group and comparison of pretest and post test level of fatigue in the control group. N = 60(30+30)

Group	Pretest		Post Test		Mean Difference score	Paired 't' test & p-value
	Mean	S.D	Mean	S.D		
Experimental Group	32.90	11.48	25.80	10.14	**7.10**	**t = 9.998[b] p=0.0001, S***[a]**
Control Group	32.70	11.26	32.93	11.23	0.23	t = 1.651[b] p=0.109, N.S[a]
Mean Difference score	0.20		**7.13**		***p<0.001, *p<0..05 S – Significant N.S – Not Significant	
Student Independent 't' test value	t = 0.068[c] p=0.946[a] N.S		**t = 2.481[c] p=0.012[a] S***			

*p < 0.05[a]; paired 't' test,[b] independent 't' test[c]

Table 4 shows that the experimental group's pretest mean score on fatigue was 32.90±11.48, while their posttest means score was 25.80±10.14. 7.10 was the mean difference score. At the p<0.001 level, the computed paired "t" test value of t = 9.998 was statistically significant. The control group's pretest mean score on fatigue was 32.70±11.26, and their posttest mean score was 32.93±11.23. The score for mean difference was 0.23. At the p<0.05 level, the computed paired "t" test value of t = 1.651 was not statistically significant. There was a statistically significant difference in the posttest level of dyspnea between the two groups, with a statistical significance threshold of p<0.05, as indicated by the calculated student independent "t" test value of t=2.481 in the post test.

Figure 4: Shows that the experimental group's SPO2 pretest mean score was 88.67±1.09, and its posttest mean score was 93.80±1.78. 5.13 was the mean difference score. At the p<0.001 level, the computed paired "t" test value of t = 22.966 was statistically significant. The control group's SPO2 pretest mean score was 88.93±1.46, and its posttest mean score was 89.13±1.25. The score for mean difference was 0.20. At the p<0.05 level, the computed paired "t" test value of t = 1.361

was not statistically significant. There was no statistically significant difference in the pretest level of SPO2 between the two groups, as indicated by the estimated student independent "t" test result of t = 0.801 in the pretest. There was a statistically significant difference in the post-test level of SPO2 between the two groups, which was statistically significant at the p<0.001 level, according to the calculated student independent "t" test value of t = 11.706 in the post test.

Table 5: Effectiveness of breathing exercise on respiratory rate among patients with COPD in the experimental group and comparison of pretest and post test level of respiratory rate in the control group. N = 60(30+30)

Group	Pretest		Post Test		Mean Difference score	Paired 't' test & p-value
	Mean	S.D	Mean	S.D		
Experimental Group	15.13	1.35	20.33	2.29	**5.20**	**t = 13.310[b] p=0.0001, S***[a]**
Control Group	14.93	1.46	15.13	1.63	0.20	t = 1.795[b] p=0.083, N.S[a]
Mean Difference score	0.20		**5.20**		***p<0.001 S – Significant N.S – Not Significant	
Student Independent 't' test value	t = 0.549[c] p=0.585 N.S		**t = 10.11[c] p=0.0001 S*** **			

*p < 0.05[a]; paired 't' test,[b] independent 't'test[c]

The table 9 depicts that the pre-test mean score of respiratory rate in the experimental group was 15.13±1.35 and post test mean score was 93.80±1.78. The mean difference score was 2.29. The calculated paired 't' test value of t = 13.310 was statistically significant at p<0.001 level, where as in control group was 14.93±1.46 and post-test mean score was 15.13±1.63. The mean difference score was 0.20. The calculated paired 't' test value of t = 1.795 was not statistically significant at p<0.05 level. This clearly infers that there was statistically significant difference between the pre-test and post test level of respiratory rate in the control group who had undergone normal hospital routine measures. The calculated student independent 't' test value of t = 0.549 in the pretest shows that there was no statistically significant difference between the pretest level of respiratory rate between the two groups.

DISCUSSION

Chronic and progressive air flow blockage and a number of important systemic symptoms that might impair functional ability and health status are characteristics of COPD. The lung condition known as chronic obstructive pulmonary disease (COPD) is highly irreversible and is among the leading causes of illness and mortality globally.[17] Airflow limitation and chronic respiratory symptoms characterize COPD, a common, treatable, and preventable condition caused by irregularities in the airways and alveoli. It is mostly caused by prolonged exposure to harmful gasses or particles, and the host has control over it. These people consistently experience symptoms such as fatigue, chest tightness, wheezing, dyspnea, phlegm coughing, and so on.(18). End-stage COPD is defined by severe airflow limitation, severely limited performance, and systemic complications. Patients often present with the first acute exacerbation of COPD at an advanced stage. As the disease progresses, exacerbations may become more frequent and life-threatening complications may develop. [19] Breathing exercise (BE) has proven to be a crucial component of a thorough respiratory rehabilitation program for individuals with COPD. Nonetheless, Gosselink R. 2003 [10] noted that a

variety of BE techniques, including diaphragmatic breathing, pursed-lip breathing (PLB), slow and deep breathing, and relaxation breathing, have been studied. The majority of COPD patients were found to be between the ages of 46 and 55; 19 (63.3%) in the experimental group and 16 (53.3%) in the control group were male; 26 (86.7%) in the experimental group and 23 (76.7%) in the experimental group had been afflicted for less than six months; 25 (83.3%) in the experimental group and 23 (76.7%) in the control group had a family history of COPD; 28 (90%) in the experimental group and 28 (93.3%) in the control group were not vegetarians. Similar research was done in 2003 by Jones AY et al., and the results showed low quality evidence of a substantial improvement in RR (p=0.05) in the DBE group compared to the control group. The current study confirms these findings. [21]. According to the current study's findings, the experimental group's dyspnea pretest mean score was 23.23±8.21, and its posttest mean score was 16.36±6.60. 6.87 was the mean difference score. At the p<0.001 level, the computed paired "t" test value of t = 11.823 was statistically significant.

This demonstrates unequivocally that the degree of dyspnea among COPD patients was considerably decreased in the experimental group following the administration of breathing exercises. A related study by Borge CR, et al., 2015 [23] found low quality evidence of a significant improvement in RR (p=0.05; level) in the DBE group compared to the control group. Between the DBE group and the control group, there was no statistically significant difference in dyspnea (p=0.47) or SGRQ score (p=0.58). PLB's identical trial did not show any greater improvement in COPD patients' dyspnea sensation than the control group.

It's probable that the PLB training length in the included studies was insufficient to have a beneficial effect on COPD patients' dyspnea sensation. Following eight weeks of PLB training, Holland et al. (Holland AE et al., 2012) [19] observed a significant decrease in the experience of dyspnea. Nevertheless, a very little training period of one to two days was used in three of the four included investigations (Garrod R et al., 2005) [24]. One study only employed a 12-week PLB training regimen. (Et al., Nickell MA, 2007) [25] Therefore, more research is required to determine how long PLB training lasts and how dyspnea feels in COPD patients.

Table 7 shows that the experimental group's SPO2 pretest mean score was 88.67±1.09, and its posttest mean score was 93.80±1.78. 5.13 was the mean difference score. At the p<0.001 level, the computed paired "t" test value of t = 22.966 was statistically significant. This demonstrates unequivocally that the experimental group of COPD patients' SPO2 levels increased dramatically following the administration of breathing exercises. The experimental group's pretest mean score for exhaustion was 32.90±11.48, while their posttest mean score was 25.80±10.14, according to the current study's results. 7.10 was the mean difference score. At the p<0.001 level, the computed paired "t" test value of t = 9.998 was statistically significant.

This demonstrates unequivocally that the experimental group of COPD patients experienced a considerable decrease in fatigue following the administration of breathing exercises. The comparable investigation carried out in 2011 by Zakerimoghadam M, et al. [27]. The experience group's average tiredness severity before (55.766) and after (40.166) utilizing the respiratory workouts differed substantially (p=0%). There is a small difference in the study between the control group (p=0.002) before (54.166) and after (52.200).

The use of respiratory exercises and the degree of weariness showed a strong inverse relationship (r=-0.593, p=0.001). Following the trial, the experience group's mean fatigue intensity dropped to 40.916 ± 14.4 and the control group's to 52.20 ± 8.539 (p=0.001). After the trial, there was a substantial difference in the degree of weariness between the experience and control groups. A related study by Dr. G. Bhuvaneswari et al., 2019[28] found that balloon therapy was statistically significant in heart rate and O2 saturation at the p<0.05 level between the pre- and post-test, and that there was a significant difference in respiratory rate as measured by spirometry between the balloon therapy group and the control group. Therefore, balloon therapy outperforms spirometry. The current study's findings demonstrated the impact of breathing exercises on the respiratory rates of COPD patients in the experimental group and compared the respiratory rates of the control group at the pretest and posttest. The posttest respiratory rate difference between the two groups was statistically significant at the p<0.001 level, as indicated by the estimated student independent "t" test result of t = 10.11 in the post test. Patients with COPD had improved respiratory parameters as a result of the effective management. The study by Sebastiao, B. F. (2023)(29) further emphasizes how crucial it is to support air quality self-management as part of overall disease treatment plans. Patients can be empowered and their well-being improved by a nurse-led, patient-centered intervention that addresses several areas of self-management. To strengthen the evidence basis and increase the likelihood that these medicines will be helpful for people with these conditions, more study is required. Hence the research hypothesis **H_1** that stated earlier **"There is a significant difference between** the pre-test and post-test level of dyspnea, fatigue, and respiratory parameters after the administration of Mindfulness meditation and breathing exercise among patients with COPD was accepted for the experimental group and not accepted for the control group.

CONCLUSION

The outcomes of multiple clinical trials suggest that breathing exercises are a cost-effective and efficient way to relieve symptoms including weariness and dyspnea. When used in conjunction with conventional medical treatment as an adjuvant in the management of COPD, it can enhance respiratory health. Applying these complex methodologies to more acutely ill patients during exacerbations will be an even greater challenge.

Limitation: Patient who has chronic obstructive pulmonary disease (COPD) is vulnerable to various psychological limitations. Dyspnea is an undesirable yet beneficial side effect of exercise for a lot of patients.

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Author Contributions

All authors have reviewed the final version to be published and agreed to be accountable for all aspects of the work.

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