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Effectiveness of Individualized Physical and Breathing Exercise Programs for COPD Patients Among College Students: A Comparative Analysis

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Abstract: In this study, the quantitative research technique will be used. Data was collected from 200 COPD patients using a method comparable to an experiment but with a control group that is not. All pulmonary functions in the experimental group were very significant, indicating that the therapy was successful for pulmonary function, in contrast to the group that served as a control, where there was no statistically significant relationship between FIV, PEFR, oxygen saturation, or BHT. Additionally, the treatment's impact on breathing exercises was examined, and the experimental group showed a very significant result. Scored 11.62 on the post-test and 5.6 on the Alternative Nostrils exercise. A extremely important ANE score was determined. The results of the diaphragmatic exercise were 11.9 on the post-test, up from 5.3 on the pre-test. Statistical analysis revealed a small but notable shift in the post-test treatment group's DE score. Purse lip exercise resulted in an increase from 5.08 on the pretest to 11.2 on the posttest. Significant improvements in the experimental group's purse lip exercise score were seen.

Keywords: Effectiveness, COPD, Breathing exercise

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INTRODUCTION

One of the most dangerous lung diseases that may strike middle-aged and elderly persons is lung disease that is chronically obstructive (COPD). A major issue in global health, chronic obstructive pulmonary disease (COPD) is becoming more common. Few studies have examined the impact of integrated disease management (IDM) on exercise capacity and health status over the long term in primary care patients with moderate to severe chronic obstructive pulmonary disease (COPD). When asked about their health-related quality of life, people with chronic obstructive pulmonary disease (COPD) tend to do badly, have a lower exercise capacity, and have low oxygen consumption (Vo (2)) on standard cardiopulmonary exercise tests. There are distinct associations between COPD mortality and each of these three factors when examined independently. A survival forecast Exercise capacity, dyspnoea, body mass index (BMI), airflow obstruction, and the 6-minute walk test (6MWT) are the five factors that may be used to evaluate individuals with chronic obstructive pulmonary disease (COPD). The BODE index is the name given to this multidimensional index. When chronic obstructive pulmonary disease (COPD) worsens, its health impacts become more apparent. Various quality of life surveys is often used to measure it.

While smoking is known to increase the likelihood of developing little is understood about the causes of chronic obstructive pulmonary disease (COPD). patients' symptoms compare to those of non-smokers.

The airflow restriction that which defines COPD and which cannot be cured in its entirety. One physiological marker that is often used to assess the severity of chronic obstructive pulmonary disease is forced expiratory volume in one second (FEV1). But the FEV1 doesn't capture all the systemic symptoms that people with COPD experience. We postulated that a multi-dimensional grading system that evaluated both the C.O.P.D. symptoms in the respiratory and systemic systems (COPD) would improve patient classification and prognosis.

It is believed that the development of chronic obstructive pulmonary disease (COPD) involves aided by both smoking and acute exacerbations. These conclusions, however, are based on research involving current smokers, but data from studies including former smokers is few and often conflicting. The study's primary objective was to identify if Consistent mild exacerbations are associated with poorer functional and clinical outcomes in chronic obstructive pulmonary disease (COPD) patients, as does a faster drop in forced expiratory volume in one second (FEV1).

Greater Coronary artery disease (COPD) patients often have inherent positive end-expiratory pressure. How they feel about their health, how much they can exercise, and pulmonary functional ability may all be enhanced with a breathing exercise programme plan that utilizes an adequate PEEP. There has been a lack of comprehensive research on the use of expiratory resistive loading, a technique for regulating spontaneous breathing to counteract PEEPI, in COPD patients.

LITERATURE REVIEW

Liao (2024) Finding out what motivates, what opportunities present themselves, and what capabilities individuals with chronic obstructive lung disease have to participate in physical exercise is the primary goal of this research. Design Two respiratory units of a university hospital in China were the sites of a phenomenological qualitative research that used the motive, opportunity, and capacity model. Methods In patients who were present during the interviews and those who had been released within the last six months made up the participants, who were chosen based on age, gender, and length of illness. This research highlights the need of inspiring participation motivation, offering opportunities, and increasing skill for involvement in order to achieve effective engagement. Patients with COPD who are reluctant or unable to exercise may benefit substantially by increasing the amount of exercise they perform when they are not in their spare time. if healthcare departments pay more attention, interdisciplinary collaboration is fostered, activity guidance and counselling are more effective, and individual preferences are considered.

Silva (2021) Patients suffering from COPD exhibit both pulmonary and extrapulmonary dysfunctions. Pulmonary rehabilitation programmes are the methods utilised to lessen the impact of these abnormalities. Nevertheless, PRP is only available in certain medical facilities, and the research of affordable home rehabilitation programmes used generic prescriptions, which may have resulted in negligible benefits. Therefore, new, inexpensive procedures including physiotherapy supervision and individualised prescription are urgently needed. This research details a low-cost, easily-accessible pulmonary rehabilitation programme and compares its efficacy with and without a weekly session supervised by a physiotherapist for COPD sufferers. Methods The Federal University of São Carlos (UFSCar) Spirometry and Respiratory Physical Therapy Laboratory conducted a clinical investigation, and this outlines the procedures that were followed. The results of a pilot study informed the decision to recruit fifty patients for

the main study. Conclusions and Implications of the Study Soon, the new, inexpensive supervised rehabilitation program will be available, making PRP for COPD patients more accessible and effective. programme, which includes home exercises, shows favourable outcomes, particularly on exercise capacity.

Ubolnuar (2019) to review the current research into how breathing exercises (BEs) affect the quality of life, dyspnea, exercise capacity, and ventilation in chronic obstructive pulmonary disease (COPD) patients. To determine the potential for bias, researchers used a method devised by the Cochrane Collaboration; to rank the quality of the evidence, they employed the GRADE system. We looked at 19 studies (n=745) in all. The quality of the evidence varied from somewhat low to poor. The groups who engaged in diaphragmatic breathing exercise (DBE), combined BEs, ventilatory feedback with exercise (VF), and pursed-lip breathing (PLB) showed a significantly greater improvement in respiratory rate ($p \leq 0.001$) when contrasted with the control regions. Further, PLB significantly improved total respiratory length ($p<0.001$), inspiratory time ($p=0.007$), and tidal volume ($p<0.001$). The physical component of quality of life was significantly improved by singing when compared to the control groups, and the combination of VF and exercise significantly increased inspiratory capacity ($p<0.001$). No BE was more effective than the control group in alleviating dyspnea ($p>0.05$). If you're looking to improve your breathing and overall quality of life, try singing, VF + exercise, DBE, mixed BEs, or PLB. Conditions must be met before these BEs may be used to improve COPD patients' ventilation and quality of life. based on data of poor to moderate quality.

Sharma (2023) Those who suffer with COPD have a diminished quality of life, which is a major problem for public health. While pharmaceutical therapies and symptom control were formerly the mainstays in the treatment of COPD, there has been a recent trend towards more all-encompassing rehabilitation programmes. Exercise training, education, psychological support, and self-management techniques are some of the contemporary methods to this study aims to examine rehabilitation for chronic obstructive pulmonary disease (COPD). Methods now used to aid individuals with COPD during rehabilitation try to meet their unique demands by focusing on patient-centered and interdisciplinary methods. Prior research confirms that these all-encompassing programmes have beneficial effects, such as increased exercise ability, decreased symptoms, and better general health. Within the framework of contemporary medicine, this study intends to delve more into the impact of different pulmonary rehabilitation approaches on chronic obstructive pulmonary disease (COPD) therapy. The study's overarching goal is to give information on the advantages and effectiveness of pulmonary rehabilitation for COPD patients. after a thorough search of academic databases including SCOPUS, PubMed, SciELO, Google Scholar, and the Cochrane Library and other relevant publications. improved pulmonary rehabilitation intervention selection and execution, and improved patient outcomes, might result from healthcare practitioners following the recommendations made in this research, which could substantially improve evidence-based practices.

Tymruk-Skoropad, (2018) Chronic obstructive pulmonary disease (COPD) rehabilitation therapies are the focus of this research. The incidence of chronic obstructive pulmonary disease (COPD) has prompted much study on physical therapy and respiratory rehabilitation for people with the disease, the severity of impairment it causes, the high expense of treatment, and our ever-increasing and more nuanced understanding of its causes and progression. The search was conducted on July 20, 2017, using the keyword "COPD," COPD. rehabilitation, "COPD exercises," "COPD physical therapy," "COPD physical

activity," Final Product Twenty percent of all papers concern exercise with the purpose of alleviating COPD symptoms (1984 references). According to the results, the PubMed database had the most COPD studies. This amount accounted for 3,588 entries in 2012, an increase of 135% over the preceding decade. Last remarks the majority of the study results pertaining to chronic obstructive pulmonary disease (COPD) in evidence-based medicine databases are associated with rehabilitation (9.8-14.95%), whereas physical therapy (3.8-11.5%) receives less attention. According to systematic studies, physical therapy and rehabilitation have a crucial role in the treatment of chronic obstructive pulmonary disease (COPD) patients, the present focus should be on defining respiratory rehabilitation and assessing its efficacy.

RESEARCH METHODOLOGY

In this context, "population" is the sum of all patients who meet certain requirements. No less than 200 individuals suffering from COPD hospitalized to a subset of Jaipur hospitals make up the study's population. The whole COPD patient population admitted to a certain Jaipur hospital. Accessible while data was being collected. To conduct a research study, researchers choose a subset of the population to serve as a sample. The sample for this research includes 200 (two hundred) a solitary hospital in Jaipur that treats patients with chronic obstructive pulmonary disease (COPD). Choosing the equipment Building a tool, evaluating its validity and reliability, and collecting data are all parts of a data gathering method. Research tools are the physical objects that researchers use to gather information. The primary research could not proceed without first obtaining official approval from the relevant authorities. From October 15, 2021, until October 21, 2021, the research was in action. The COPD patients gave their informed permission to the study. The data collecting method was conducted in a confidential manner.

DATA ANALYSIS

To find out how breathing exercises work, the data was analysed and interpreted from 200 COPD patients. In order to get the answers to research questions, data must be analysed by classifying, arranging, altering, and summarizing it. To study the research connection, the data must first be reduced to an understandable and interpretable form, and this is where analysis comes in.

Table 1: Evaluation of the control group's lung function scores before and after treatment

Variable	Before	After	Paired t - test	P - Value	Significance
FIV	675.3 ± 69.8	694.4 ± 72.1	-1.862	0.032877	Significant
PEFR	239.5 ± 22.95	245.2 ± 19.7	-2.121	0.018214	
Oxygen saturation	77.17 ± 5.65	78.8 ± 4.61	-2.349	0.010412	
Chest expansion	3.29 ± 0.19	3.66 ± 0.26	-12.81	0.000001	Highly significant
BHT	11.26 ± 3.95	11.91 ± 4.21	-1.354	0.089468	Not significant

Table 1 shows that the pre-test paired "t"-test was used to determine, among 200 patients, that the control group's FIV scores were 675.3 before the intervention and 694.4 after the intervention. Therapy resulted in a slight but significant improvement to the FIV score. The results of the PEFR examination showed that there was a change in the scores of 239.5 and 245.2, respectively. There were small but statistically significant changes in the post-test control group's PEFR score. There was an increase from a pre- to post-test oxygen saturation score of 77.17 to 78.8. In the control group that was tested after the test, there were small but significant changes in the oxygen saturation score. The patient's chest enlargement was 3.29 on the pretest and 3.66 on the posttest. The post-test control group showed extremely significant changes in chest expansion score, whereas the pre-test BHT score was 11.26 and 11.91, respectively, after comparing the two groups; there was no significant difference.

Table 2: Comparison of pre-test &post-test pulmonary function scores of COPD patients in experimental group.

Variable	Before	After	Paired t - test	P - Value	Significance
FIV	709.5 ± 40.85	1096.8 ± 65.12	-57.31	0.000001	All are highly significant
PEFR	251.6 ± 35.24	446.9 ± 117.5	-16.22	0.000001	
Oxygen saturation	77.3 ± 3.48	93.55 ± 2.61	-38.42	0.000001	
Chest expansion	3.47 ± 0.22	5.43 ± 0.57	-33.93	0.000001	
BHT	13.48 ± 5.56	36.26 ± 6.69	-30.24	0.000001	

Table 2 shows that Using a paired "t"-test, we were able to determine that the control group's FIV scores improved from 675.3 before the intervention to 694.4 after the intervention in the pre-test among 200 patients. Therapy resulted in a slight but significant improvement to the FIV score. The results of the PEFR examination showed that there was a change in the scores of 239.5 and 245.2, respectively. There were small but statistically significant changes in the post-test control group's PEFR score. There was an increase from a pre- to post-test oxygen saturation score of 77.17 to 78.8. In the control group that was tested after the test, there were small but significant changes in the oxygen saturation score. The patient's chest enlargement was 3.29 on the pretest and 3.66 on the posttest. The post-test control group showed extremely significant changes in chest expansion score, whereas the pre-test BHT score was There was no statistically significant difference between the two groups' post-test scores (11.91 vs. 11.26).

Table 3: Comparison of pre-test & post pulmonary function score of COPD patients in control group.

Variable	Control	Experimental	t - test	P - Value	Significance
FIV	19.1 ± 102.5	387.3 ± 67.58	-29.99	0.000001	All are highly significant
PEFR	5.65 ± 26.64	195.3 ± 120.4	-15.38	0.000001	
Oxygen saturation	1.61 ± 6.86	16.25 ± 4.23	-18.176	0.000001	
Chest expansion	0.37 ± 0.29	1.96 ± 0.58	-24.61	0.000001	
BHT	0.65 ± 4.79	22.78 ± 7.53	-24.77	0.000001	

In the control group, the FIV value is 19.1 ± 102.5, whereas in the experimental group, it is 387.3 ± 67.58. The peripheral artery flow rate (PEFR) in the control group is 5.65 ± 26.64, whereas in the experimental group it is 195.3 ± 120.4. The controls had an oxygen saturation value of 1.61 ± 6.86, whereas the experimental group had a value of 16.25 ± 4.23. The chest expansion value for the experimental group was 1.96 + 0.58, whereas for the control group it was 0.37 ± 0.29. The body heat index (BHT) value in the control group is 0.65 ± 4.79, but in the experimental group it is 22.78 ± 7.53.

Table 4: Comparison ofpre-test & post-test pulmonary function scores of COPD patient's relation between control groups.

Variable	Pre-test	Post-test	Paired t- test	P - Value	Significance
Alternative Nostrils exercise	6.04 ± 2.65	7.56 ± 1.13	-5.499	0.000001	Highly significant
Diaphragmatic exercise	5.2 ± 1.87	5.28 ± 1.82	-1.21	0.22961	Not significant
Purse lip exercise	5.28 ± 1.34	6.3 ± 0.91	-5.78	0.000001	Highly significant

Table 4 shows that out of 200 patients, 6.04 were in the Alternative Nostrils exercise group before the exercise and 7.56 were in the post-exercise group. This suggests that the breathing exercise had a positive impact on the control group. The ANE score showed considerable improvements after therapy. There was a 5.28-point improvement in diaphragmatic exercise from a 5.2 point pre- to post-test.

The post-test control group showed slight but insignificant improvements in DE score, whereas the purse-lip exercise increased from 5.28 before the test to 6.3 after it. Control group after the test showed considerable and large changes in their purse lip exercise score.

Table 5: Comparison of pre-test & post-test pulmonary function scores of COPD patient's relation between experimental groups.

Variable	Pre-test	Post-test	Paired t- test	P - Value	Significance
Alternative Nostrils exercise	5.6 ± 1.42	11.62 ± 0.814	-38.89	0.000001	All are significant
Diaphragmatic exercise	5.3 ± 1.034	11.9 ± 0.795	-46.79	0.000001	
Purse lip exercise	5.08 ± 1.01	11.2 ± 1.84	-28.25	0.000001	

Table 5 shows that out of 200 patients, 5.6 had a better score on the pre-test when using the Alternative Nostrils exercise, and 11.62 had a better score on the post-test when using the same method. This was determined using a paired "t"-test. After the therapy, there were substantial changes in the ANE score. The results of the diaphragmatic exercise were 11.9 on the post-test, up from 5.3 on the pre-test. The post-test therapy group showed minor but very significant improvements in DE score. Purse lip exercise resulted in an increase from 5.08 on the pretest to 11.2 on the posttest. Significant changes were seen in the purse lip exercise score in the therapy group after the test.

Table 6: Examining the difference between the control and experimental groups' pre- and post-test values for various breathing exercise parameters.

Variable	Control Group	Experimental l Group	t- test	P - Value	Significance
Alternative Nostrils exercise	1.52 ± 2.77	6.02 ± 1.59	-14.11	0.000001	All are significant
Diaphragmatic exercise	0.08 ± 0.66	6.56 ± 1.4	-41.79	0.000001	
Purse lip exercise	1.02 ± 1.76	6.12 ± 2.17	-18.26	0.000001	

Table 6 shows that there was a shift of 1.52 points in the control group's Alternative Nostrils exercise, 0.08 points in the diaphragmatic exercise, and 1.02 points in the purse lip exercise from the pre- to finishing the test. In the experimental group, there was a change in scores of 6.02 for the Alternative Nostrils exercise,

6.56 for the Diaphragmatic exercise, and 6.12 for the Purse Lip exercise from the pre- to post-test.

CONCLUSION

The chapter focuses on the study's key results and how they relate to nursing practice. At several Jaipur hospitals, researchers looked at how breathing exercises affected lung function in individuals suffering from chronic obstructive pulmonary disease. The current research used probability sampling techniques to identify 200 patients from Indus Jaipur Hospital and Jaipur Hospital. This study makes use of the Quantitative Research Approach. The information was collected by means of organized surveys, and the results were analysed using the most relevant statistical methods.

References

1. Tymruk-Skoropad, Kateryna & Tsizh, Lyubov & Vynogradskyi, Bogdan & Pavlova, Iuliia. (2018). Physical therapy in chronic obstructive pulmonary disease (analysis of the evidence-based medicine). Physiotherapy Quarterly. 2018. 1-8. 10.5114/pq.2018.75993.
2. Sharma, Shivanshu & Salibi, Dr & Tzenios, Nikolaos. (2023). Modern approaches of rehabilitation in COPD patients. Special journal of the Medical Academy and other Life Sciences. 1. 10.58676/sjmas.v1i6.39.
3. Ubolnuar, Nutsupa & Tantisuwat, Anong & Thaveeratitham, Premtip & Lertmeharit, Somrat & Kruapanich, Chathipat & Mathiyakom, Witaya. (2019). Effects of Breathing Exercises in Patients with Chronic Obstructive Pulmonary Disease: Systematic Review and Meta-Analysis. Annals of Rehabilitation Medicine. 43. 509-523. 10.5535/arm.2019.43.4.509.
4. Silva, Marcela & Ferreira Arcuri, Juliano & Di Lorenzo, Valéria. (2021). Individualized, low-cost and accessible pulmonary rehabilitation program based on functional clinical tests for individuals with COPD—a study protocol of a randomized controlled trial. Trials. 22. 10.1186/s13063-021-05267-9.
5. Liao, Yuanyu & Yu, Jiaohua & Zhan, Yuxin & Liu, Yunfang & Zhou, Yaoling & Wang, Huan & Liu, Xinghong & Wang, Weiwei & Ma, Yu & Lan, Fenfen. (2024). Motivating factors for physical activity participation among individuals with chronic obstructive pulmonary disease: A qualitative study applying the motivation, opportunity, and ability model. PLOS ONE. 19. 10.1371/journal.pone.0303858.
6. Saint-Maurice P.F., Troiano R.P., Bassett D.R., Graubard B.I., Carlson S.A., Shiroma E.J., Fulton J.E., Matthews C.E. Association of Daily Step Count and Step Intensity with Mortality among US Adults. *JAMA.* 2020; 323:1151–1160. doi: 10.1001/jama.2020.1382.
7. Wen C.P., Wai J.P.M., Tsai M.K., Yang Y.C., Cheng T.Y.D., Lee M.-C., Chan H.T., Tsao C.K., Tsai S.P., Wu X. Minimum amount of physical activity for reduced mortality and extended life expectancy: A prospective cohort study. *Lancet.* 2011; 378:1244–1253. doi: 10.1016/S0140-6736(11)60749-6.
8. Gimeno-Santos E., Frei A., Steurer-Stey C., de Batlle J., Rabinovich R.A., Raste Y., Hopkinson N.S.,

Polkey M.I., Van Remoortel H., Troosters T., et al. Determinants and outcomes of physical activity in patients with COPD: A systematic review. *Thorax*. 2014; 69:731–739. doi: 10.1136/thoraxjnl-2013-204763.

9. Waschki B., Kirsten A., Holz O., Muller K.C., Meyer T., Watz H., Magnussen H. Physical activity is the strongest predictor of all-cause mortality in patients with COPD: A prospective cohort study. *Chest.* 2011; 140:331–342. doi: 10.1378/chest.10-2521

10. Nishiyama O., Yamazaki R., Sano H., Iwanaga T., Higashimoto Y., Kume H., Tohda Y. Physical activity in daily life in patients with idiopathic pulmonary fibrosis. *Respir. Investig.* 2018; 56:57–63. doi: 10.1016/j.resinv.2017.09.004.

11. Cordova-Rivera L., Gibson P.G., Gardiner P.A., McDonald V.M. A Systematic Review of Associations of Physical Activity and Sedentary Time with Asthma Outcomes. *J. Allergy Clin. Immunol. Pract.* 2018; 6:1968–1981.e2. doi: 10.1016/j.jaip.2018.02.027.