

Breathing Exercises Effects on Pulmonary Function among COPD Patients

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Abstract: ***Introduction:** Breathing exercise is a specific type of controlled breathing in the practice of yoga. It involves holding one nostril closed while inhaling, and then holding the other nostril closed while exhaling. The process is then reversed and repeated. Alternate nostril breathing is said to have many physical and psychological benefits, including stress reduction and improved breathing and circulation.1 **Material & Methods:** Quantitative research approach used in this study with a true experimental design. Setting of the study was imperial hospital, Jaipur. Target population patient with COPD, probability sampling techniques was used in this study and sample size 20 COPD patients. **Result:** The results obtained were considered statistically significant at 5 percent level of significance ($p \leq 0.05$). Data was presented in the form of tables, graphs and diagrams. **Discussion:** Breathing exercise improves exercise capacity, symptoms, and quality of life in COPD patients, and is therefore recommended in all stages of the disease.*

Keywords: Assess, Effect, Breathing Exercises, COPD

1. Introduction

Chronic obstructive pulmonary disease is a serious lung disease for individuals in middle age and especially in old people. 2 Chronic obstructive pulmonary disease constitutes a growing health care problem worldwide. Integrated disease management (IDM) of mild to moderate COPD patients has been demonstrated to improve exercise capacity and health status after one year, but long-term results are currently lacking in primary care.3

Patients with COPD have decreased exercise capacity and low oxygen consumption ($V_o(2)$) during formal cardiopulmonary exercise testing, and lower scores on health-related quality of life questionnaires. When isolated, these three variables show different correlations with COPD mortality. The multidimensional BODE (body mass index [BMI], airflow obstruction, dyspnea, and exercise capacity in COPD) index, which comprises four variables including the 6-min walk test (6MWT), predicts survival in COPD.4

Chronic obstructive pulmonary disease (COPD) has a major impact on health status in accordance with disease severity. It is usually assessed by the various quality of life questionnaires.5

Smoking is a major risk factor for chronic obstructive pulmonary disease (COPD); however, the similarities and differences in clinical presentation between smokers and non-smokers are not fully described in patients with COPD.6

2. Material & Methods

Research Approach: The research approach will be used in this study is Quantitative Research Approach

Research Design: A true experimental design, which includes Manipulation, Control, **Randomization** (Pre test-Post test with control group)

Research Setting: Imperial Hospital Jaipur

Target: All the patients admitted with COPD in selected Hospital of Jaipur.

Accessible: Available at the time of data collection.

Samples: The patients who fulfilled the inclusive and exclusive criteria are the samples.

Sampling Technique: Probability sampling using simple random technique by lottery method.

Sample Size: The data will be collected from 20COPD patients at selected Hospital Jaipur

Data Collection Method

The Data Collection was divided into part-I, Part-II and part III Observation checklist for the level of participation in breathing exercises.

3. Results

Table 1: Socio Demographic data

Variables	Control Group		Experimental Group	
Gender distribution				
Gender	n	In %	n	In %
Male	6	60%	10	100%
Female	4	40%	0	0%
Frequency distribution of age				
Age Interval	n	In %	n	In %
20 – 30	3	30%	7	70%
31 – 40	3	30%	3	30%
41 – 50	2	20%	0	0%

51 – 60	2	20%	0	0%
Distribution of marital status				
Marital status	n	In %	n	In %
Married	7	70%	9	90%
Single	2	20%	1	10%
Divorced / Widow	1	10%	0	0%
Distribution of educational status				
Educational status	n	In %	n	In %
Formal Education	2	20%	1	10%
Primary & Middle education	6	60%	9	90%
Secondary education	1	10%	0	0%
Graduate and above	1	10%	0	0%
Distribution of occupational status				
Occupational status	n	In %	n	In %
Self-employment	1	10%	0	0%
House wife	3	30%	3	30%
Private employee	5	50%	7	70%
Govt. employee	1	10%	0	0%
Distribution of income/capita				
Income Interval	n	In %	n	In %
Rs. < 3000	2	20%	0	0%
3000-5000	3	30%	3	30%
5001-10000	2	20%	5	50%
10001-15000	1	10%	2	20%
> 15000	2	20%	0	0%

Table 2:

Variables	Control Group		Experimental Group	
Distribution of Residential status				
Residential status	n	In %	n	In %
Urban	6	60%	10	100%
Rural	4	40%	0	0%
Distribution of family type				
Family type	n	In %	n	In %
Nuclear	2	20%	6	60%
Joint	6	60%	4	40%
Extended	2	20%	0	0%
Distribution of allergy type				
Allergy type	n	In %	n	In %
Food	2	20%	3	30%
Environment	2	20%	3	30%
plants	4	40%	4	40%
Animal	2	20%	0	0%
Previous experience of hospitalization				
Hospitalization experience	n	In %	n	In %
Yes	2	20%	7	70%
No	8	80%	3	30%
Distribution of DBE experience				
DBE experience	n	In %	n	In %
Yes	6	60%	6	60%
No	4	40%	4	40%
Distribution of smoking habits				
Smoking habits	n	In %	n	In %
Yes	3	30%	5	50%
No	7	70%	5	50%
Distribution of no. of cigarettes /day				
No. of cigarettes/ day	n	In %	n	In %
2-4	0	0%	0	0%
4-6	3	30%	4	40%
6-8	3	30%	5	50%
> 8	4	40%	1	10%

Table 3: Comparing before and after effect protocol assessment of control group

Variable	Before	After	Paired t-test	P-Value	Significance
FIV	698.3 ± 60.77	728.4 ± 68.13	-3.325	0.00444	Significant
PEFR	239 ± 26.26	255 ± 17.52	-1.9	0.04492	
Oxygen saturation	77.4 ± 5.39	82.1 ± 4.46	-3.46	0.00358	
Chest expansion	3.35 ± 0.24	3.62 ± 0.303	-4.83	0.00047	Highly significant
BHT	12.8 ± 4.58	16.4 ± 4.1	-4.13	0.00128	Significant

In control group FIV, PEFR, oxygen saturation and BHT were significant and chest expansion were highly significant

Table 4: Comparing before and after effect of protocol assessment of treatment group

Variable	Before	After	Paired t-test	P-Value	Significance
FIV	717.4 ± 42.74	1083.6 ± 65.24	-21.14	0.000001	All are highly significant
PEFR	251.7 ± 35.19	455.6 ± 127.4	-5.03	0.00036	
Oxygen saturation	79.2 ± 4.67	93.2 ± 2.89	-10.01	0.00001	
Chest expansion	3.46 ± 0.22	5.32 ± 0.598	-9.22	0.000001	
BHT	13.9 ± 5.89	34.9 ± 7.29	-14.38	0.000001	

In treatment group all parameters are highly significant

Table 5: Comparing change in value of different parameters between before and after of control and treatment group

Variable	Control Group	Treatment Group	t-test	P-Value	Significance
FIV	30.1 ± 47.52	366.2 ± 51.97	-14.32	0.000001	Highly significant
PEFR	16 ± 14.44	203.9 ± 121.68	-4.6	0.00011	
Oxygen saturation	4.7 ± 4.1	14 ± 4.2	-4.77	0.00008	
Chest expansion	0.27 ± 0.17	1.86 ± 0.66	-7.06	0.000001	
BHT	3.6 ± 2.62	21 ± 4.38	-10.23	0.000001	

In the above table value changes in treatment group is very large as compare to control group and all are highly significant.

Table 6: Comparing between before and after effect of breathing exercise of control group

Variable	Before	After	Paired t-test	P-Value	Significance
Alternative Nostrils exercise	5.9 ± 2.26	7.4 ± 0.92	-2.496	0.01704	All are significant
Diaphragmatic exercise	5.2 ± 1.78	5.8 ± 1.25	-2.25	0.025502	
Pulse lip exercise	4.8 ± 1.4	6.3 ± 0.9	-2.18	0.02846	

In control group all parameters are significant

Table 7: Comparing between before and after effect of breathing exercise of treatment group

Variable	Before	After	Paired t-test	P-Value	Significance
Alternative Nostrils exercise	5.6 ± 1.28	11.6 ± 0.8	-12.73	0.000001	All are highly significant
Diaphragmatic exercise	5.3 ± 1.01	11.9 ± 0.7	-15.46	0.000001	
Pulse lip exercise	5.2 ± 0.98	11.1 ± 1.89	-7.85	0.000001	

In treatment group all parameters are highly significant.

If p – Value < 0.05 then it is statistically significant

If P – Value < 0.001 then it is highly significant

Table 8:

Characteristics		Control Group		Treatment Group	
		Before	After	Before	After
FIV	Normal	0	0	0	8 (80%)
	Mildly decreased	1 (10%)	2 (20%)	0	2 (20%)
	Moderately decreased	9 (90%)	8 (80%)	10 (10%)	0
	Severely decreased	0	0	0	0
PEFR	Normal	0	0	0	8 (80%)
	Mildly decreased	3 (30%)	6 (60%)	6 (60%)	2 (20%)
	Moderately decreased	7 (70%)	4 (40%)	4 (40%)	0
	Severely decreased	0	0	0	0
Oxygen saturation	Normal	0	0	0	8 (80%)
	Mildly decreased	2 (20%)	7 (70%)	4 (40%)	2 (20%)
	Moderately decreased	8 (80%)	3 (30%)	6 (60%)	0
	Severely decreased	0	0	0	0
Chest expansion	Normal	0	0	0	6 (60%)
	Mildly decreased	0	2 (20%)	0	4 (40%)
	Moderately decreased	10 (10%)	8 (80%)	10 (10%)	0
	Severely decreased	0	0	0	0
BHT	Normal	0	0	0	6 (60%)
	Mildly decreased	1 (10%)	1 (10%)	2 (20%)	4 (40%)
	Moderately decreased	5 (50%)	9 (90%)	5 (50%)	0
	Severely decreased	4 (40%)	0	3 (30%)	0

4. Discussion

Chronic obstructive pulmonary disease is a serious lung disease for individuals in middle age and especially in old people & it reduce the its seriousness by doing the breathing exercise in continues routine schedule.

5. Conclusion

Analysis showed that self-management programmes can provide a significant benefit to COPD patients in terms of exercise capacity and some aspects of their self-efficacy. Adherence to a written action plan can reduce exacerbation recovery time by enabling prompt awareness of symptom& breathing exercise.

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