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A Study to Assess the Effectiveness of Yoga Breathing on Dyspnea, Oxygen Saturation and Anxiety among Patient with COPD Attending Medicine OPD of HSK Hospital and Research Centre, Bagalkot

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Abstract **Original Research Article**

Background of the study: Chronic obstructive pulmonary disease (COPD) is a chronic inflammatory lung disease that causes obstructed airflow from the lungs. Symptoms include breathing difficulty, cough, mucus (sputum) production and wheezing and Yoga is a type of exercise in which you move your body into various positions in order to become more fit or flexible, to improve your breathing, and to relax your mind and Breathing is relaxation technique in which a person focuses on taking slow, deep breaths. Deep breathing involves breathing in slowly through the nose and then out through the mouth using the diaphragm (the thin muscle that separates the chest from the abdomen) and abdominal muscles. ***Aim*:** The aim of study was to assess association between Pre-test levels of dyspnea, oxygen saturation and anxiety among patients with COPD with their selected socio-demographic and clinical variables. ***Methodology*:** The research design selected for this study was pre-experimental one group pre-test and post-test design. The sample size comprises of 30 patients with COPD attending medicine OPD of HSK hospital and research centre, Bagalkot. The sampling technique adopted for this study will be Purposive sampling technique. In the present study the data will be collected by using Modified Borg Dyspnea scale, generalized anxiety disorder scale (GDA-7) and oxygen saturation scale, the data analysis done by using descriptive and inferential statistics in terms of frequency distribution, percentage, mean, mean percentage, Standard Deviation, paired 't' test and Chi-square test. ***Result*:** The finding revealed that there is statistical significance of the difference between pre-test and post- test scores of the COPD patients shows that difference between dyspnea mean pre-test [2.63] with SD 1.06 and mean post-test [1.46] with SD 2.93, was found to be statistically difference at 0.05 level of significant [t=4.42 (p valve=0.00043) p<0.05]. As Hypothesis H1 states, the mean post-test level of dyspnea will be significantly lower than the mean pre-test level of dyspnea among COPD patients. ***Conclusion**:* The study proved that administration of yoga breathing on reduction of dyspnea, anxiety and increase oxygen saturation was effective, scientific, and Logical.

Keywords: Assess, effectiveness, Yoga breathing exercises, Dyspnea, Anxiety, oxygen saturation, COPD.

INTRODUCTION

Dyspnea commonly referred to as shortness of breath, is the subjective sensation of uncomfortable breathing comprised of various sensations of varying intensity. It is a common symptom impacting millions of people and maybe the primary manifestation respiratory, cardiac, neuromuscular, psychogenic, systemic illness, or a combination of these. Dyspnea can be either acute or chronic with acute occurring over hours to days and chronic occurring for more than 4 to 8 weeks [1].

According to the global burden of disease study, COPD will be the fifth leading cause of disability and the third leading cause of death in the world in the first half of the twenty-first century. For developing countries, COPD is expected to be the fourth leading cause of disability for males and the third for females in 2020.Chronic obstructive pulmonary disease (COPD)

has been defined by the global initiative for obstructive lung disease (GOLD) as a disease state characterized by airflow limitation that is not fully reversible. The diffusing capacity of lung for carbon monoxide (DLCO) is a measure of the ability of gas to transfer from the alveoli across the alveolar epithelium and the capillary endothelium to the RBCs. Gas exchange is impaired by parenchyma destruction, which disrupts the local matching of ventilation and perfusion. The imbalance of ventilation perfusion may lead to alteration of transfer factor. It is usually due to a change in either or both the volume of blood in the alveolar capillaries and the diffusion capacity of alveolar capillary membrane. In chronic lung disease, diffusion capacity is impaired when there is a reduction in the effective surface area for gas exchange in lung, in disease of lung parenchyma in which there is loss of lung tissue or part of the lung, not ventilated [2].

Yoga originated in ancient India, and denotes the union between the individual self and the transcendental self. Yoga practice mainly consists of Asana (Posture- a particular position of the body which contributes to steadiness of body and mind), Pranayama (to control the breathing in a superior and extra-ordinary way to get maximum benefits.) and Meditation. There are several facts supporting the physiological changes that can occur following yoga therapy [3].

Hence researcher has planned to undertake "A study to assess the effectiveness of yoga breathing on dyspnea, oxygen saturation and anxiety among patient with COPD attending medicine OPD of HSK hospital and research centre, Bagalkot."

MATERIAL AND METHODS

Study design and participants

Present study was pre-experimental one group pre-test and post-test design Conducted between 02-05-2024 to 02-06-2024, A sampling technique adopted for this study will be Purposive sampling technique was used to select the 30 subjects for the present study. COPD patients with Dyspnea, oxygen saturation and anxiety, who were able to understand read and write Kannada or English and available at the time of data collection are selected for the study. In the present study the data will be collected by using tool of Modified Borg Dyspnea scale, generalized anxiety disorder scale (GDA-7) and oxygen saturation scale with their scoring.

Instruments

Modified Borg Dyspnea scale

Its starts at "0" where patients have no difficulty breathing and progress to 10 where patients breathing difficulty is maximal.

Generalized anxiety disorder scale (GDA-7)

It consists of 4 items each item is scored on 4 points Likert [0-3] Scale total score ranges between 0-21 higher score includes higher anxiety.

Oxygen saturation scale

Pulse oximeter [saturation probe] a standard pulse oximeter tested for its accuracy will be used to assess the oxygen saturation among patient with COPD.

All three Scales are translated to Kannada and then back translated to English. The reliability of the test was found out by using Karl Pearson's co-efficient of correlation formula. The reliability co-efficient for Modified Borg Dyspnea scale was r = 0.80 and Generalized anxiety disorder scale (GDA-7) obtained was r = 0.89.

Data Collection Procedure

Prior permission was taken from relevant institutions before the beginning of data collection procedure The data collection was carried out from 02-05-2024 to 02-06-2024, among COPD Patients attending medicine OPD of HSK Hospital and research Centre Bagalkot. Permission was obtained from the medical superintendent HSK Hospital and Research Centre Bagalkot, before data collection. Written consent was obtained from 30 subjects. COPD patients were selected on the basis of convenient sampling technique. Then the investigator conducted pretest on assessment of Dyspnea oxygen saturation and anxiety level by using questionnaires. Then the Yoga breathing exercises was administered to the subjects for 15 days. After the 15 days post test was conducted to COPD patients. Then the investigator assesses the effectiveness of Yoga breathing exercises with compering the pretest and post test scores.

Data Analysis

Data will be analysed by using descriptive and inferential statistics. Numerical data obtained from the sample was organized and summarized with the help of descriptive statistics like percentages, mean and standard deviation. Chi-square test used to find out association between Pre-test levels of dyspnea, oxygen saturation and anxiety among patients with COPD with their selected socio-demographic and clinical variables.

RESULTS

Description of socio-demographic and Clinical characteristics of Patients with COPD

Percentage wise distribution of COPD patients the Majority of the age group have (46.67%) of COPD patients are in the age group of 38-47 year, The majority of gender shows (86.67) of COPD patients are male, the Majority of religion 15(50%) of COPD patients are in Hindu, most of COPD (50%) are there no formal education, the Majority COPD patients have seen in both nuclear and joint family, most of COPD patients (43.33%) family income 15001-20000/-, the Majority of 29(96.67%) of COPD patients (96.67%) are married,

most of the of COPD patients(66.67%) are mixed diet, The majority of COPD patients (36.67%) are smoking, most of COPD patients (36.67%) are working in domestic cleaners, the majority of COPD patients (60%) are staying in rural area, most of COPD patients (86.67%) are not previously not practicing yoga breathing and The Majority of COPD patients (50%) seen in suffering from COPD in many years.

Assessment of pretest Dyspnea Oxygen saturation and Anxiety scores of patients with COPD

Level of Fatigue	Mean	SD	Mean Diff.	SD Diff.	t-value	p-value
Pre-test	34.24	4.07	14.06	1.14	19.622	0.00001*
Post-test	20.18	2.93				

Table 5.2: Levels of dyspnea in patients with COPD

SL. No	Levels	Range	Frequency	Percentage
1	Nothing at all	0	0	0%
2	Very slight	1	4	13.33%
3	Slight	2	11	36.66%
4	Moderate	3	8	26.66%
5	Some what sever	4	6	20%
6	Sever	5	1	3.33%

Table 5.2 shows that the majority 11 COPD patients having slight Dyspnea in pre-test, 6 were belongs to somewhat sever, 4 belongs very slight, One COPD patients belongs sever and no One patients having Dyspnea.

Table 5.3: Levels of oxygen saturation in patients with COPD

Sl. No	Level	Frequency	Percentage
1	<90	25	83.33%
2	>90	5	16.66%

Table 5.3 shows that majority of 25 COPD patients belongs to < 90% oxygen saturation and 5 COPD patients belongs to >90% of oxygen saturation.

Table 5.4: Levels of anxiety in patients with COPD

Sl. No	Levels	Range of score	Frequency	Percentage
1	None	0-4	0	0%
2	Mild Anxiety	5-9	3	10%
3	Moderate Anxiety	10-14	26	86.67%
4	Severe Anxiety	15-21	1	3.33%

Table 5.4 shows that majority 26 COPD patients belongs to moderate anxiety score in pre-test, 3 belongs to mild anxiety, 1 belongs to sever anxiety and no one COPD patients belongs to none in the pre-tests score.

Table 5.5: Mean & SD of pretest score of dyspnea, oxygen saturation and anxiety of patients with COPD

Variables	Mean	SD
Dyspnea	2.63	1.06
Oxygen Saturation	88.83	0.69
Anxiety	12.76	1.71

To find out Significance of difference between pretest post-test scores of Dyspnea, Oxygen saturation and Anxiety of patients with COPD.

Table 5.6

Sl. No	Tools	Pre-test		Post-test		Mean Difference	t-value	p value
		Mean	SD	Mean	SD			
1	Dyspnea	2.63	1.06	1.46	0.97	1.17	4.42	0.00043
2	Oxygen Saturation	88.83	0.69	91	0.5	2.17	10.56	0.00001
3	Anxiety	12.76	1.71	4.43	1.95	8.33	17.52	0.00001

The study results showed that Findings related to the significance of the difference between pre-test and post- test scores of the COPD patients shows that difference between dyspnea mean pre-test [2.63] with

SD 1.06 and mean post-test [1.46] with SD 2.93, was found to be statistically difference at 0.05 level of significant [t=4.42 (p valve=0.00043) p<0.05]. As Hypothesis H_1 states, the mean post-test level of dyspnea will be significantly lower than the mean pre-test level of dyspnea among COPD patients.

The study results showed that Findings related to the significance of the difference between pre-test and post- test scores of the COPD patients shows that difference between oxygen saturation mean pre-test [88.83] with SD 0.69 and mean post-test [91] with SD 0.5, was found to be statistically difference at 0.05 level of significant [t=10.56 (p valve=0.00001) p<0.05]. As Hypothesis H_1 states, the mean post-test level of oxygen saturation will be significantly higher than the mean pre-test level of oxygen saturation among COPD patients.

The study results showed that Findings related to the significance of the difference between pre-test and post- test scores of the COPD patients shows that difference between anxiety mean pre-test [12.76] with SD 1.71 and mean post-test [4.43] with SD 1.95, was found to be statistically difference at 0.05 level of significant [t=17.52 (p valve=0.00001) p<0.05]. As Hypothesis H_1 states, the mean post-test level of anxiety will be significantly lower than the mean pre-test level of anxiety among COPD patients.

Association between pre-test levels of Dyspnea, oxygen saturation and anxiety of COPD patients selected with their selected socio-demographic and clinical variables.

Table 5.7: Association between pre-test the level of Dyspnea of COPD patients with their selected socio demographic and clinical variables

Sl. No	Socio-demographic variable	DF	Chi-Square Value	P Value
1	Age in year	1	0.05	0.837
2	Gender	1	0.63	0.427
3	Religion	1	0.07	0.791
4	Educational status	1	0.02	0.887
5	Type of family	1	0.03	0.862
6	Family monthly in come	1	0.02	0.887
7	Marital status	1	0.01	0.92
8	Diet	1	1.02	0.217
9	Habit	1	3.52	0.03*
10	Occupation	1	2.22	0.135
11	Area of residence	1	0.41	0.52
12	If you have previously practicing any yoga breathing	1	0.08	0.777
13	how long you have been suffering from COPD	1	0.99	0.318

*P<0.05 significant

Chi square test was used to find out the association between pre-test of Dyspnea score of their selected socio demographic variable by using 2x2contegency table.

Findings reveal that was no significant association between pre-test Dyspnea score of Yoga breathing exercises on COPD patients of socio demographic variable like Age, Gender, Religion, Educational status, Type of family, Marital status, Family month income, Diet, Occupation, Area of residence, previously practicing any yoga breathing and Only Habit of the COPD patients is significant.

Table 5.8: Association between pre-test the level of Oxygen saturation of COPD patients with their selected socio demographic and clinical variables

Sl. No	Socio-demographic variable	DF	chi-square value	P Value
1	Age in year	1	0.99	0.837
2	Gender	1	1.22	0.135
3	Religion	1	0.07	0.791
4	Educational status	1	0.02	0.887
5	Type of family	1	0.03	0.862
6	Family monthly in come	1	0.02	0.887
7	Marital status	1	0.05	0.92
8	Diet	1	0.63	0.427
9	Habit	1	1.52	0.217
10	Occupation	1	3.83	0.041*
11	Area of residence	1	0.03	0.52

12	If you have previously practicing any yoga breathing	1	0.02	0.777
13	how long you have been suffering from COPD	1	0.63	0.427

*P<0.05 significant

Chi square test was used to find out the association between pre-test of Oxygen saturation score of their selected socio demographic variable by using 2x2contegency table.

Findings reveal that was no significant association between pre-test Oxygen saturation score of Yoga breathing exercises on COPD patients of socio demographic variable like Age, Gender, Religion, Educational status, Type of family, Marital status, Family month income, Diet, Area of residence, previously practicing any yoga breathing and Only Occupation of the COPD patients is significant.

Table 5.9: Association between pre-test the level of anxiety of COPD patients with their selected socio demographic and clinical variables

Sl. No	Socio-demographic variable	DF	chi-square value	P Value
1	Age in year	1	0.05	0.427
2	Gender	1	3.49	0.048*
3	Religion	1	0.03	0.52
4	Educational status	1	0.02	0.135
5	Type of family	1	0.03	0.862
6	Family monthly in come	1	0.02	0.887
7	Marital status	1	0.01	0.92
8	Diet	1	1.52	0.217
9	Habit	1	0.08	0.777
10	Occupation	1	2.22	0.135
11	Area of residence	1	0.41	0.52
12	If you have previously practicing any yoga breathing	1	0.08	0.777
13	how long you have been suffering from COPD	1	0.99	0.318

*P<0.05 significant

Chi square test was used to find out the association between pre-test of anxiety score of their selected socio demographic variable by using 2x2contegency table.

Findings reveal that was no significant association between pre-test anxiety score of Yoga breathing exercises on COPD patients of socio demographic variable like Age, Religion, Educational status, Type of family, Marital status, Family month income, Diet, Habit, Occupation, Area of residence, previously practicing any yoga breathing and Only Gender of the COPD patients is significant.

DISCUSSION

This pre-experimental one group pre-test and post-test design. The sample size comprises of 30 patients with COPD attending medicine OPD of HSK hospital and research centre, Bagalkot. Findings revealed that, highest percent of COPD Patients were having dyspnea, anxiety and less oxygen saturation, The results of the present study are support with the study conducted by the results of the present study are support with the study conducted by Mr. Jaju ds *et al*., (2018-19), Effects of pranayam breathing on respiratory pressures and sympathovagal balance of patients with chronic airflow limitation and in control subjects. The study results showed that patients' respiratory parameters were significantly lower than those of controls. Patients' maximum respiratory pressures did not improve after Pranayam; however, they showed significant improvement in VAS 5.4 ± 2.4 to 7.2 ± 1.2 ($P < 0.03$). Controls showed significant increase in MIP after Pranayam exercises. There were no changes in other spirometry indices. Controls showed significant increase in their systolic blood pressure and stroke index after exercise. The vago-sympathetic balance shifted towards sympathetic in both patients and controls after exercise. Hence the study concluded that the improvement in MIP in controls indicated the positive effect of Pranayam exercise however, it may not be an adequately stressful exercise to produce changes in the respiratory parameters of COPD patients. The increase in VAS in patients suggested improvement in respiratory distress and quality of life [4].

The results of the present study are support with the study conducted by Mandlik GV *et al*., (2023), evidence for the effectiveness of a single session of yoga or its components including meditation and breathing techniques in reducing acute stress reactivity in healthy adults. Following the PRISMA guidelines, we searched Medline, EMBASE, Cochrane, CINAHL, and PsycINFO on 30th July 2023 for randomised controlled or crossover trials of yoga components and reporting physiological and/or psychological outcome measure(s) related to stress reactivity. Risk of bias (ROB) was

assessed using the Cochrane ROB 2 tool. Data were synthesised narratively. The study results showed that Twenty-one out of 28 eligible studies (n = 2574) relating to 31 interventions (meditation [n = 22], breathing [n = 4] and yoga [n = 5]) reported outcomes in favour of the intervention. Stress reactivity was reported to be reduced by 71% of studies measuring physiological outcomes and 65% of studies measuring psychological outcomes [5].

RECOMMENDATIONS

- Similar study can be conducted to assess the effectiveness of yoga breathing exercises on reduction Dyspnea and Anxiety along with increasing Oxygen saturation, with the Multi interventional techniques.
- Similar study can be conducted by using 2 or more variables as a comparative study.

CONCLUSION

After thorough analysis of the data, it is understood that reduction of dyspnea, anxiety and increase in oxygen saturation are co related and interventions like yoga breathing exercises are helpful in COPD patients to enhance their quality of life and reduce their dyspnea, anxiety and increase in oxygen saturation, Hence it is clear that there is a association between Pre-test levels of dyspnea, oxygen saturation and anxiety among patients with COPD with their selected socio-demographic and clinical variables.

Ethical Consideration

The study was approved by the Institutional Ethical Clearance Committee, BVVS Sajjalashree Institute of Nursing Sciences, Bagalkot.

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Conflicts of Interest: There are no conflicts of interest

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REFERENCES

1. Hashmi, M. F., Modi, P., & Basit, H. Dyspnea. [Updated 2023 Feb 19]. In: StatPearls [Internet]. Treasure Island (FL): StatPearls Publishing; 2023 Jan-. Available from: https://www.ncbi.nlm.nih.gov/books/NBK499965/
2. Soni, R., Munish, K., Singh, K. P., & Singh, S. (2012). Study of the effect of yoga training on diffusion capacity in chronic obstructive pulmonary disease patients: A controlled trial. *International journal of yoga*, *5*(2), 123-127. doi:10.4103/0973-6131.982303)
3. Gopal, K. S., Bhatnagar, O. P., Subramanian, N., & Nishith, S. D. (1973). Effect of Yogasanas and Pranayamas on blood pressure, pulse rate and some respiratory function. *Indian J Physiol Pharmacol*, 73, 273-276.
4. Jaju, D. S., Dikshit, M. B., Balaji, J., George, J., Rizvi, S., & Al-Rawas, O. (2011). Effects of pranayam breathing on respiratory pressures and sympathovagal balance of patients with chronic airflow limitation and in control subjects. *Sultan Qaboos University Medical Journal*, *11*(2), 221.
5. Mandlik, G. V., Siopis, G., Nguyen, B., Ding, D., & Edwards, K. M. (2024). Effect of a single session of yoga and meditation on stress reactivity: A systematic review. *Stress and Health*, *40*(3), e3324.