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A Study To Assess The Effectiveness Of Salt Therapy On Clinical Outcome Among Patients With Chronic Obstructive Pulmonary Disease In Selected Hospitals, Erode.

Mr. Jishnu K.S[1], Prof. Dr. P Padmavathi[2], Mrs. R Gowri[3]
[1](*M.Sc. Nursing II Year, Dhanvantri College Of Nursing, Namakkal, Tamil Nadu.)*
[2](*Principal, Dhanvantri College Of Nursing, Namakkal, Tamil Nadu.)*
[3](*Professor, Dhanvantri College Of Nursing, Namakkal, Tamil Nadu.)*

Abstract
Background: *Chronic obstructive pulmonary disease (COPD) is the third leading cause of death worldwide and result socio-economic burden among patients and their family. Salt therapy with 3% saline nebulization helps to improve the clinical outcome of the patients and reduce the duration of hospital stay.*
Objectives: *To assess the effectiveness of salt therapy in improving the clinical outcome among chronic obstructive pulmonary disease patients in experimental group by comparing with control group. Design: Quasi-experimental non-randomized control group design.*
Materials and Methods: *Quasi-experimental non-randomized control group design was used. The study was conducted with 60patients; 30 patients in experimental and 30 patients in control group. Respiratory clinical outcome assessment scale was used as the assessment tool.*
Results: *The study findings concluded that the clinical outcome score comparison between the experimental and control group denotes that 70% of adequate score and 30% of them with moderately adequate score. Highly significant difference was found in pre and post-test score of COPD patients in experimental group with paired t-test score 10.57 at p<0.0001. Post-test clinical outcome score depicts the effectiveness of salt therapy in experimental group by comparing with control group. The unpaired t-test score 7.68 which was statistically significant to p<0.0001. No significant association between the clinical outcome parameters and their demographic*
variables.
Conclusion: *The study findings concluded that most of the patients were male with age group 51-60 years, living in urban area, had moderate socio-economic status and had no other respiratory illness. There was significant effectiveness of salt therapy on clinical outcome among COPD patients in experimental than control group. Therefore, salt therapy can be used as safe and effective to improve the clinical outcome among COPD patients.*
Key word: *Effectiveness, Salt therapy, Clinical outcome, Selected hospitals.*

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I. Introduction

The state of one's health is reflective of an individual's ability to meet life's challenges and maintain his or her capacity for optimal functioning. This requires the various aspects of one's makeup i.e., mental, physical and biochemical, to maintain a level of functioning that has a positive influence and support for one another. Respiratory health is an emerging concept focuses mainly on improving the health status by doing breathing clean air, regular exercises, drinking plenty of water and relax with nature. We can regulate health using simple steps of breathing and can bring the world healthier **(Cadmiller,2020).**

Chronic obstructive pulmonary disease (COPD) is a common lung disease causing restricted airflow and breathing problems. It is a group of pulmonary disorders characterized by chronic inflammation and obstruction of airways that interferes with normal breathing. In people with COPD, the lungs can get damaged in such a way that their airways are narrowed or blocked by inflammation and increased mucus production. Symptoms include cough, sometimes with phlegm, difficulty breathing, wheezing and tiredness are seen. COPD is also called as chronic obstructive lung disease (COLD). It is sometimes called emphysema or chronic bronchitis. Smoking and air pollution are the most common causes of COPD. People with COPD are at higher risk of other health problems **(WHO, 2023).**

Chronic obstructive pulmonary disease (COPD) third leading cause of death worldwide which affects both men and women, causing 3.23 million of mortality in 2019. Nearly 90% of COPD deaths in those under 70 years of age occur in low- and middle-income countries (LMIC). COPD is the seventh leading cause of poor health worldwide (measured by disability-adjusted life years). Tobacco smoking accounts for over 70% of COPD cases in high-income countries. In LMIC tobacco smoking accounts for 30–40% of COPD cases, and household air pollution is a major risk factor **(CDC NHS 2020).**

As COPD progresses, people find it more difficult to carry out their normal activities, often due to breathlessness. There may be considerable financial burden due to limitation of workplace and home productivity and cost of medical treatment. During flare-ups, people with COPD find their symptoms become worse and they need to receive extra treatment at home or to be admitted in the hospital for emergency care **(WHO, May 2022).**

A meta-analysis study conducted regarding the therapeutic approaches for chronic obstructive pulmonary disease exacerbations revealed the treatment strategies such as antimicrobial therapy, anti-inflammatory drugs, oxygen therapy, nebulization therapy, steam inhalation, spirometry, chest physiotherapy and breathing exercises. The study concluded that the need to explore new therapeutic approach for COPD patients which reduces hospital stay and economic burden respectively **(Rosenwasser Y., et.al., 2022).**

Treatment strategies using drugs for respiratory distress have only palliative effect with many side effects, especially those with corticosteroids. In order to reduce the chance of complications, it is necessary to follow certain alternative techniques. Salt therapy is an alternative treatment strategy used in all sort of indigenous system of medicine. trials have confirmed that salt therapy is an effective option for relieving symptoms and improving functional parameters in bronchiectasis, chronic bronchitis, mild and moderate asthma, and chronic obstructive pulmonary disease **(Bollmeier S. G -2020).**

Nebulization with 3% saline is comparatively less economical in nature and components are easily available. 3% saline inhalation via aerosols has been practiced in clinical setting to reduce pulmonary congestion and improve respiration of patients with chronic bronchitis. A double-blinded, crossover study comparing inhaled hypertonic saline to hypotonic saline administered via nebuliser twice daily for 2 weeks on 22 patients. The study revealed that the significant improvement in the clinical parameters of patients with chronic bronchitis **(Agatha C, et al., 2020).**

Need For The Study

Chronic obstructive pulmonary disease has attributed by smoking with 15% of patients having significant airflow obstruction. According to American Lung Association (ALA) in 2020, 12.5 million people, or 5.0% of adults, reported a diagnosis of COPD (chronic obstructive pulmonary disease, chronic bronchitis, or emphysema Figure 1.1. In this, rates were greater among non-Hispanic whites compared to other racial and ethnic groups. Women affected more with COPD compared to men. Those ages 65 and older are affected more compared to younger age groups (American Lung Association-ALA-2021).

In 2019, COPD killed 3.22 million people and the number of deaths rose by 17.5% between 2007 and 2017. The main burden of COPD is seen in Latin America, Sub-Saharan Africa, India, China and Southeast Asia. As a complex disease, COPD has diverse pathological manifestations. The inflammatory pulmonary process, principally triggered by cigarette smoke, induces a series of molecular and cellular reactions with detrimental effects on lung tissue. Also include expiratory flow limitation with dynamic collapse of the airways, air trapping, and lung hyperinflation (World Health Organization-2019).

A cross-sectional study to assess the prevalence of chronic obstructive pulmonary disease in suburban areas of Tamil Nadu. A total of 1050 patients of both genders classified according to the severity score using GOLD standard. Data was collected and analysed using SPSS. It concluded that the various factors responsible for chronic obstructive pulmonary disease such as tobacco smoking, biomass fuel exposure, passive smoking and so on (Kanmani Karthikeyan, et al., 2019).

A single centered, single-blinded, prospective randomized study to assess the effect of nebulized hypertonic saline for COPD on a total of 59 patients with 29 in hypertonic saline group and 30 in the standard saline group for every six hours for at least 24 hours. Patients randomized to the two treatment groups were similar in gender. Modified Borg dyspnea scale was used to assess the effect and it revealed that the group with hypertonic saline has improvement in respiratory parameters than the other group who received plain saline nebulization (Kurti Patel., et.al, 2017).

The researcher observed that all the patients with chronic obstructive pulmonary disease required hospital stay and take medications for a longer duration. From his clinical experience and literature review understood that hospital stay and taking medications for a longer duration increases the economic burden of the patients as well-as their families. This enlightened the researcher to deliberate regarding the other treatment modalities for COPD patients and decided to conduct a study to assess the effectiveness of salt therapy in clinical outcome among patients with chronic obstructive pulmonary disease in selected hospitals, Erode.

Objectives Of The Study

1. To assess the clinical outcome of chronic obstructive pulmonary disease in control and experimental group before administering salt therapy.
2. To find the effect of salt therapy in improving clinical outcome among experimental group.
3. To evaluate the effectiveness of salt therapy on improving clinical outcome among chronic obstructive pulmonary disease patients in experimental group by comparing with control group.
4. To find out the association between pre-test score of clinical outcome among chronic obstructive pulmonary disease patients and their selected demographic variables in control and experimental group.

Hypotheses

H1- There is significant level of improvement in clinical outcome among patients with chronic obstructive pulmonary disease receiving salt therapy in experimental group than control group.

H2- There will be a significant association between the pretest level of clinical outcome among patients with chronic obstructive pulmonary disease with selected demographic variables of experimental group.

II. Material And Methods

Study Design: Quasi-experimental design- non-randomized control group design.

Study Location: Selected hospitals, Erode, Tamil Nadu.

Study Duration: November to Deccember 2023.

Sample size: 60 male and female patients diagnosed with chronic obstructive pulmonary disease (30 each in experimental and control group).

Sample size calculation: the sample size was estimated on the basis of patients who were available during the period of data collection in male medicine ward I & II, female medicine ward I & II, and general ward.

Subjects & selection method: Non probability convenience sampling method was applied to select the samples.

Inclusion criteria:

Patients who are:

1. Diagnosed as chronic obstructive pulmonary disease between the age group of 31-70 years.
2. Present and available during the period of data collection.
3. Willing to participate in the study.

Exclusion criteria:

Patients who are:

- Previously exposed to salt therapy.
- Patients who are critically ill and diagnosed as chronic obstructive pulmonary disease exacerbation.
- Not willing to participate in the study.

Procedure methodology

Patients' symptoms were assessed using respiratory clinical outcome assessment scale which consist of respiratory rate, auscultation findings of lungs, oxygen saturation scale, oxygen requirement, modified research council (MRC) dyspnea scale and need for other medications; and scoring was done. Salt therapy was given to the experimental group with 3% sodium chloride nebulization 10-15 mins for three times a day for five consecutive days. On the fifth day, after three times of salt therapy post-test was done in experimental group. The intervention was withdrawn for control group and post-test done on the fifth day. Both pre-test and post-test score were recorded accordingly for analysis.

Statistical analysis

The data was analyze during Descriptive [Frequency and percentage], the effectiveness of the salt therapy was assessed using inferential statistics [paired and unpaired t test].The level $p< 0.05$ was considered as the cut off value or significance.

III. Result

After successfully implementing the salt therapy among COPD patients engaged in the experimental group, the clinical outcome has improved by showing difference in the parameters than the control group, which is statistically significant, which is evident in posttest with significant difference in the parameters.

Table 1 shows demographic variables with percentage distribution according to age group, (Experimental-36.70%, Control-33.30%) are between the age group of 51-60 years. In this, about 30% in experimental and 26.70% in control group are between 41-50 years of age. It also shows that 20% in experimental and 23.30% in control group are between 61-70 years of age. The gender reveals that males are commonly affected in experimental group with the percentage of 80% as well as in control group with 73.30%. The economic status reveals that the majority of participants are under middle class with the percentage of 70% in both experimental and control group. Under lower class category, 26.70% of them are in experimental group and 20% of them comes under control group.

Distribution according to the place of living revealed that the majority of 43.30% participants in experimental group and 46.60% participants in control group were residing in urban area. Nature of work illustrates that in experimental group, majority of 50% were heavy workers and 26.70% were moderate workers. In control group, 53.30% of them were moderate workers, 30% of them were heavy workers. Among the participants, majority of them are smokers with the percentage of 60% in experimental group and 53.30% in control group respectively. 40% in experimental and 46.60% in control group were non-smokers. In that, majority of the participants smoke more than 5 years with 66.70% in experimental and 68.75% in control group.

The duration of COPD illness depicts that 26.70% of the experimental and 26.70% of the control group were having the disease about 0-1 years. Whereas in experimental group, 43.30% of them were under are under 2-3 years of duration and 46.60% in control group respectively. Finally, 30% in experimental and 26.70% in control group were having the disease above 3 years. Majority of them have no other respiratory diseases with a percentage of 53.40%, in experimental group; and in control group, 50% of them have no other respiratory diseases. The comorbid illness denotes that in experimental group, 66.70% of them had comorbid illness and 33.40% of them had no comorbid illness. In control group, 60% of the participants had comorbid illness and remaining 40% of them had no comorbid illness.

Table no.2 illustrates the pretest respiratory clinical outcome assessment scale score. In experimental group, none of the patients have adequate level score, 73.30% of them have moderately adequate level score and 26.70% of them have inadequate level score. Similarly in control group, none of the patients have adequate level score, 66.70% of them have moderately adequate level score and 33.30% of them have inadequate level score. Statistically, there was no significant difference between experimental and control group; which is confirmed by using chi square test with p value $p>0.05$.

Table 2- Pretest level of respiratory clinical outcome assessment scale score.

Level of score	Experiment		Control		Chi square test
	Number	Percentage	Number	Percentage	
Adequate	0	0%	0	0%	$\chi 2=0.31$
Moderately adequate	22	73.30%	20	66.70%	p=0.57
Inadequate	8	26.70%	10	33.30%	DF=1
Total	30	100%	30	100%	

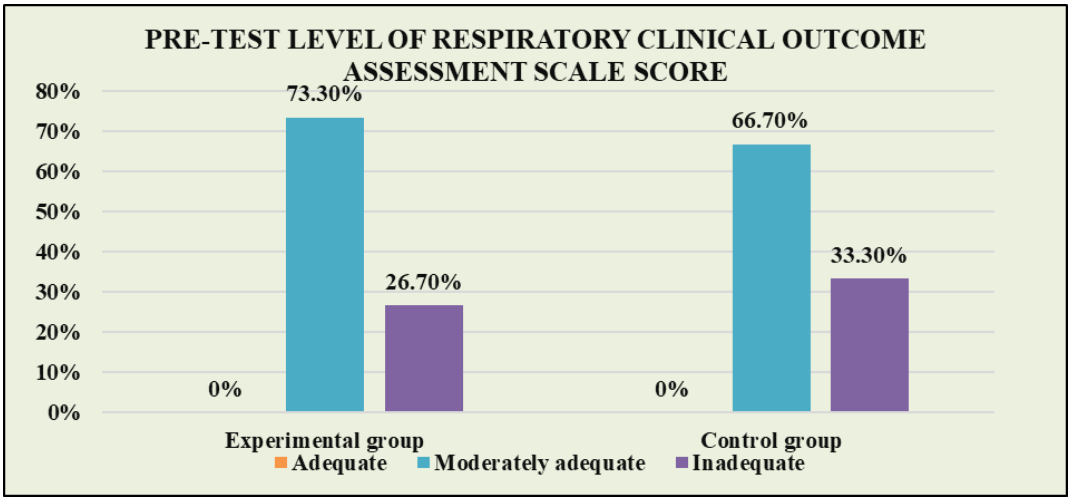

Table 3 shows the post-test score of respiratory clinical outcome assessment scale by the participants in experimental and control group. In experimental group, 70% of them have adequate level of score, 30% have moderately adequate, and none of them have inadequate level of score. In control group, none of them have adequate level of score, 73.30% have moderately adequate and 26.70% have inadequate score level. Statistically there is a significant difference in post-test level of clinical outcome between experimental and control group.

Table 3- Post-test level of respiratory clinical outcome assessment scale score.

Level of score	Experiment		Control		Chi square test
	Number	**Percentage**	**Number**	**Percentage**	
Adequate	21	70%	0	0%	**$\chi 2$=7.0**
Moderately adequate	9	30%	22	73.30%	**p=0.03***
Inadequate	0	0%	8	26.70%	**DF=2**
Total	30	100%	30	100%	

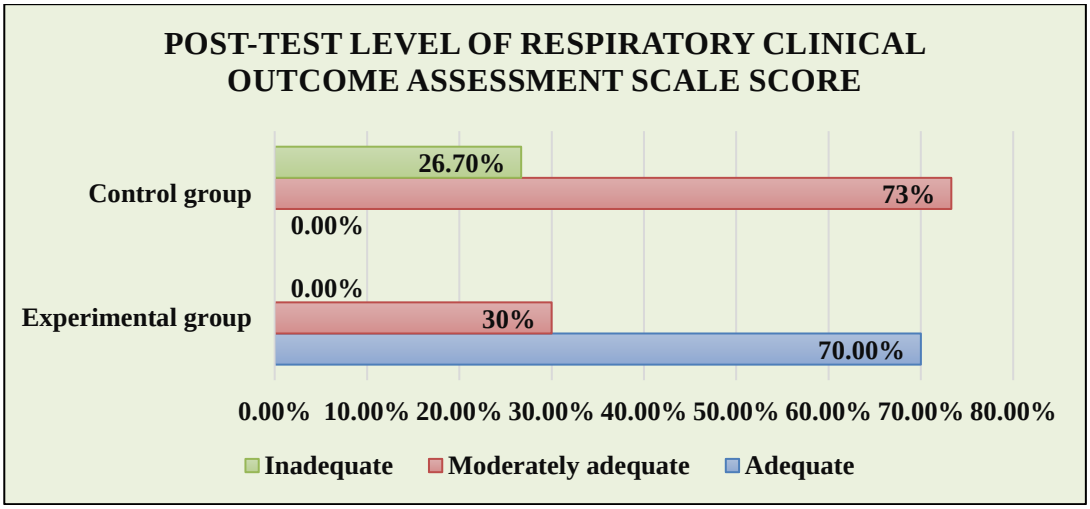

Table 4 shows paired t-test value of clinical ouutcome of chronic obstructive pulmonary disease patients in experimental group. T value is 10.57 which was statistically significant at p<0.0001. Hence H1 is accepted. It can be concluded that salt therapy was effective in improving clinical outcome among chronic obstructive pulmonary disease patients.

Table 4 Pre-test and post-test score of respiratory clinical outcome scale score of experimental group.

Group	Pre-test		Post-test		Mean difference	Paired t-test value
	Mean	**SD**	**Mean**	**SD**		
Experimental group	8.70	2.83	2.77	2.94	5.93	**t=10.57*** **

Table 5 shows unpaired t-test value of clinical ouutcome was 7.68 with the mean difference of 5.6, which was significant at p<0.0001. Therefore, H1 is accepted. It can be concluded that salt therapy was effective in improving clinical outcome among chronic obstructive pulmonary disease patients in experimental group than control group.

Table 5 Effectiveness of salt therapy in improving the clinical outcome among chronic obstructive pulmonary disease patients in experimental group in comparison with control group.

Study group	Post-test clinical outcome score Mean ±SD	Mean Difference	Unpaired t-test value
Experimental group	**2.77±2.94**	**5.6**	**7.68*** **
Control group	**8.37±2.70**		

IV. Discussion

In experimental group, respiratory clinical outcome assessment scale score denotes 73.30% of the study participants with moderately adequate score, and 26.70% of them with inadequate score. In control group, respiratory clinical outcome assessment scale score denotes 66.70% of the study participants with moderately adequate score, and 33.30% of them with inadequate score. Chi-square value depicts 0.31 with p = 0.57 which shows no significant difference between experimental and control group.

In experimental group, the pre-test mean score was 8.80 and SD was 2.83 whereas the post-test mean score was 2.77 and SD 2.94. The mean difference was 5.93. Paired t-test value depicts t=10.57 with a statistically significant to p<0.0001. Therefore, H1 is accepted and concluded that salt therapy was effective in improving clinical outcome among chronic obstructive pulmonary disease patients.

In experimental group, mean±SD of clinical outcome in post-test was 2.77±2.94. In control group, the post-test Mean±SD score was 8.37±2.70 with the mean difference of 5.6. The unpaired t-test value t=7.68 indicates an extreme statistically significant to p<0.0001. Therefore, H1 is accepted. It can be concluded that salt therapy was effective in improving clinical outcome among chronic obstructive pulmonary disease patients in experimental group than control group.

Chi square was calculated to determine the association between experimental group pre-test scores of the clinical outcome with demographic variables such as age, gender, economic status, place of living, nature of work, and so on. There was no significant there was no significant association (p>0.05) found between the pre-test scores of the experimental group with selected demographic variables.

V. Conclusion

From the findings of the study, most of the patients were male with the age group 51-60 years living in urban area. Most of the patients had moderate socio-economic status and had no other respiratory illness. There was significant effectiveness of salt therapy and on clinical outcome among patients with chronic obstructive pulmonary disease. There was no significant association between the pre-test score of experimental group with their demographic variables (Age, gender, economic status, place of living, nature of work, smoking, duration of illness (COPD), other respiratory diseases, and comorbid illness).

References

[1] Silvia R, Et.Al., (2009), "Effectiveness And Safety Of Hypertonic Saline Inhalation Combined With Exercise Training In Patients With Chronic Obstructive Pulmonary Disease: A Randomized Trial", Respiratory Care, Vol:54, Pp:327-333.

[2] Drummond Mb, Buist As, Crapo Jd, Et Al., "Chronic Obstructive Pulmonary Disease: Nhlbi Workshop On The Primary Prevention Of Chronic Lung Diseases." Ann Am Thorac Soc 2014; 11 Suppl 3: S154–160. Doi:10.1513/Annalsats.201312-432ld

[3] Vastag E, Matthys H, Kohler D, Et Al., "Mucociliary Clearance And Airways Obstruction In Smokers, Ex-Smokers And Normal Subjects Who Never Smoked." Eur J Respir Dis Suppl 1985; 139: 93–100.

[4] Mossberg B, Strandberg K, Philipson K, Et Al., "Tracheobronchial Clearance And Beta-Adrenoceptor Stimulation In Patients With Chronic Bronchitis." Scand J Respir Dis 1976; 57: 281–289.

[5] Camner P, Mossberg B, Philipson K, "Tracheobronchial Clearance And Chronic Obstructive Lung Disease." Scand J Respir Dis 1973; 54: 272–281.

[6] Anderson Wh, Coakley Rd, Button B, Et Al. "The Relationship Of Mucus Concentration (Hydration) To Mucus Osmotic Pressure And Transport In Chronic Bronchitis." Am J Respir Crit Care Med 2015; 192: 182–190. Doi:10.1164/Rccm.201412-2230oc

[7] Anderson Kn, Anderson Le, Glanze Wd (1994). "Mosby's Medical, Nursing & Allied Health Dictionary" (4th Eds). Orlando: Mosby Inc.

[8] Black M Joyce And Hawks Hokanson (2005), ''Medical Surgical Nursing'', 7th Edition, W B Saunders Company; Missouri.

[9] Brenda G Bare (1998), ''Medical Surgical Nursing'',(9th Edition), Lippincott Company; Philadelphia.

[10] Brunner And Suddarth's. (2000), ''Text Book Of Medical Surgical Nursing''. 9th Edition. Lippincott Williams And Wilkins Publication, New York.

[11] Davis Wb, Gfeller Ke, Thaut Mh (1999). "An Introduction To Music Therapy". 2nd Edition. Mcgraw-Hill, Boston.

[12] Denise, F. Polit., Bernadette, P. Hungler. (1999).Nursing Research Principles And Methods.6th Edition. Lippincott William And Wilkins Publications. New York.

[13] Gaynor M (1999). The Healing Power Of Sound. Shambhala Publications, Inc, Boston, Ma,

[14] Hungler B P And Polit Denise F (1999), ''Nursing Research'' Lippincott Company, Philadelphia

[15] Lewis Sharon Mantik Et Al., (2004), ''Medical Surgical Nursing'', (3rd Edition), Mosby Publication; Philadelphia.

[16] Arrant Bj, Le Maitre C, Romero L, Et Al. "Mucoactive Agents For Chronic, Non-Cystic Fibrosis Lung Disease: A Systematic Review And Meta Analysis" Respirology 2017;22: 1084-1092.

[17] Poole P J, Brodie S M, Stewart J M, Black P N. The Effects Of Nebulised Isotonic Saline And Terbutaline On Breathlessness In Severe Chronic Obstructive Pulmonary Disease (Copd). Aust N Z J Med. 1998;28(3):322-326.

[18] Kruthi Patel, Et.Al., "Nebulized Hypertonic Saline For Inpatient Use In Copd", Chest Annual Meeting: 2017, 786a.

[19] Khan Sy, O'driscoll Br. Is Nebulized Saline A Placebo In Copd? Bmc Pulm Med. 2004; 4:9.

[20] Beatriz H, Victoria A, Et.Al., "Impact Of Hypertonic Saline On Sputum Expectoration And Their Safety Profile In Patients With Bronchiectasis: A Randomized Crossover Trial", Journal Of Aerosol Medicine And Pulmonary Drug Delivery, 2018.