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**Effectiveness of Pulmonary Interventions (PI) on Health-Related
Quality Of Life (HRQL) and Clinical Outcomes (CO) among
Chronic Obstructive Pulmonary Disease (COPD) patients.**

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ABSTRACT

Chronic obstructive pulmonary disease (COPD) is a common, preventable and treatable disease that is characterized by persistent respiratory symptoms and airflow limitation due to airway and/or alveolar abnormalities usually caused by significant exposure to noxious particles or gases. The pulmonary interventions like pursed lip breathing, diaphragmatic breathing and incentive spirometry are the techniques which may improve the health-related quality of life and clinical outcomes of COPD patients.

A Randomized Controlled Trial on the effectiveness of pulmonary interventions (PI) on health-related quality of life (HRQL) and clinical outcomes (CO) among chronic obstructive pulmonary disease patients (COPD) was carried out in Udupi District by Flavia Castelino for the Degree of Doctor of Philosophy at MAHE, Manipal Karnataka.

The objectives of the study were to (i) assess the health-related quality of life and clinical outcomes among COPD patients; (ii) find the effectiveness of pulmonary interventions on health-related quality of life within and between the control and experimental groups; (iii) find the effectiveness of pulmonary interventions on clinical outcomes within and between the control and experimental groups; (iv) determine the relationship between the health-related quality of life and clinical outcomes (v) find the association between health-related quality of life and age gender and comorbidities, and (vi) find the association between clinical outcomes and age, gender, and comorbidities.

The conceptual framework of the study was based on the disease management and evaluation model. This model has been arisen as a novel strategy to improve

quality of care for patients with chronic diseases. The framework in this study has been described in major three areas which were input, process, and output and were connected by patient-related interventions, professional directed interventions and supported by organizational design.

The data collection tools used in the study were demographic proforma, clinical proforma, St. George's respiratory questionnaire-C (SGRQ-C), clinical outcome variables and functional dyspnea scale. The study subjects were 140 COPD patients (35 each in four groups) admitted in the selected clusters, i.e., medicine and pulmonary medicine wards and were above 40 years of age. The data was coded, tabulated and analyzed using SPSS package version 16. Descriptive as well as inferential statistics were used for analysis.

The results revealed that, out of 140 subjects 127 (90.7%) were males, 87 (62.14%) were between the age of 61-86 years and 61 (43.6%) had completed the primary schooling. Majority, 91 (65%) were residing in the rural area and 85 (60.71%) were doing high-risk occupations. Family income was rupees 5001- 10,000 per month for 86 (61.4%) subjects and 72 (51.5%) were living in the kutchha houses. All were married and 120 (85.7%) were living with their spouse. The results of clinical variables revealed that the higher number of subjects, 100 (71.4%) were suffering from COPD for the duration of 1-5 years. Majority, 134 (95.7%) were admitted to the hospital for 1-5 times with respiratory problems. A larger proportion, 120 (94.48%) of them had a history of smoking, out of which 74 (52.9%) were smoking 1-10 beedi per day; whereas 35 (25%) were smoking more than 21 beedis per day. A larger proportion, 93 (66.4%) were suffering from comorbidities and season of exacerbation was winter for 83 (59.3%) of the subjects. Majority 117 (83.6%) of them had sleep disturbance at

night due to cough and/or breathlessness. Recent stressful event before the exacerbation was expressed by 21 (15%) subjects. Treatment modality was medications for 69 (48.57%) and medications and medicated inhalers for 72 (51.42%) subjects upon admission to the hospital. All who were living with spouse had good support from the spouse during the illness.

The effectiveness of pulmonary interventions on symptom component of health-related quality of life showed a significant difference in the mean pre-test and post-test scores between control and experimental groups ($p=.001$) and also within experimental groups ($p=.001$). But there was no significant difference in the mean pre-test and post-test scores within the control group ($p=.098$). This indicates that there was improvement in the symptom scores of all the groups from pre-test to post-test except for control group. The activity component of HRQL showed a significant difference in the mean pre-test and post-test scores between control and experimental groups ($p=.001$) and also within the experimental groups ($p=.001$). But there was no significant difference in the mean pre-test and post-test scores within the control group ($p=.338$). An improvement was observed in all the experimental groups but there was marked improvement in the incentive spirometry group. In the impact component of the HRQL the analysis showed a significant difference in the mean pre-test and post-test scores between control and experimental groups ($p=.001$) and within the experimental groups ($p=.001$). But there was no significant difference in the mean pre-test and post-test scores within the control group ($p=.220$). This showed that there was improvement in the impact component of HRQL between all four groups and within three experimental groups, but marked improvement was identified in the incentive spirometry group. Total HRQL scores showed a significant difference in the mean pre-test and post-test scores within and between control and experimental groups ($p=.001$). The total HRQL was

improved in control and experimental groups, but a remarkable improvement was identified in the incentive spirometry group. Thus the incentive spirometry technique was effective in improving the symptom, activity, impact components and also the total HRQL of the COPD patients.

The effectiveness of pulmonary interventions on clinical outcomes among COPD patients revealed that there was no significant difference in the BMI within the IS ($p = .540$), DB ($p = .391$), PLB ($p = .547$) and control ($p = .255$) groups and between the control and experimental groups ($P = .438$). There was no significant difference in the heart rate within the control ($p = .652$), IS ($p = .345$), DB ($p = .825$), and PLB groups ($P = .879$) and between control and the experimental groups ($p = .894$). The findings of the respiratory rate revealed that there was no significant difference in the mean pre-test and post-test scores within control group ($p = .915$), IS group ($p = .194$), DB group ($p = .682$) and PLB group ($p = .666$) and between control and experimental groups ($p = .855$). The findings of the peak expiratory flow rate showed a significant difference in the mean pre-test and post-test scores within and between the control and experimental groups ($p = .001$) and there was marked improvement in the incentive spirometry and pursed lip breathing groups. The mean pre-test and post-test scores of forced expiratory volume in one second showed a significant difference in between the control and experimental groups ($p = .001$) and within incentive spirometry group ($p = .001$) and control group ($p = .026$) but there was no significant difference within the DB ($p = .066$), and PLB ($p = .227$). This indicates that there was marked improvement in the incentive spirometry group when compared to any other group. The FVC showed a significant difference between control and experimental groups ($p = .003$) and within the incentive spirometry group ($p = .001$). The results of FEV1/FVC showed a significant

difference between control and experimental groups ($p=.001$) and within the incentive spirometry group ($p=.001$).

The subjects in the experimental groups had better health-related quality of life and clinical outcomes compared to the control group. Among all experimental groups the subjects from incentive spirometry group were showing the best results in related to HRQL and clinical outcomes like PEFr, FEV₁, FVC and FEV₁/FVC and also there was reduction in dyspnea. Thus to improve the health related quality of life of patients with COPD, it is good to practice the breathing techniques like incentive spirometry, diaphragmatic breathing and pursed lip breathing, those which can help in the betterment of their personal and social life and also will keep them more active.

Key words: Pulmonary interventions, chronic obstructive pulmonary disease, COPD, health-related quality of life, HRQL, CO, Udupi.