

Effect of Self-Management Teaching Strategies on Chronic Obstructive Pulmonary Disease Patients with Dyspnea

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Abstract

Background: Because self-management is linked to better clinical outcomes, it is becoming more and more crucial for patients with chronic obstructive pulmonary disease (COPD). **The aim of the study:** To evaluate the effect of self-management teaching strategies on chronic obstructive pulmonary disease patients with dyspnea. **Research design:** Quasi-experimental (pre-post) research design was utilized. **Subjects and methods:** A purposive sample of 40 adult patients diagnosed with COPD. A study was conducted in the chest department and outpatient clinic at Assiut University Hospital. **Tools:** Three tools were utilized; a Patient assessment sheet, a Modified Medical Research Council Dyspnea Scale (mMRC), and a Dyspnea Management Questionnaire (DMQ). **Results:** The mean age of the studied patients was 58.87±6.38 years, 67.5% of patients were males, and more than half of patients were current cigarette smokers 52.5%. After three months of applying the strategies a significant decrease in Modified Medical Research Council Dyspnea Scale (mMRC) was found post-intervention compared with that pre-intervention ($P = \leq 0.001$). There was a statistically significant difference between pre/post strategies application reflected a positive influence on patients' levels of dyspnea which in turn improved their quality of life in all dimensions of the dyspnea management scale (dyspnea intensity, dyspnea anxiety, activity avoidance, self-efficacy, and strategies satisfaction) ($P = \leq 0.001$). **Conclusion:** This study showed that self-management strategies could reduce dyspnea of patients with COPD and improve the health status. **Recommendation:** Provide booklet with sufficient relevant written and visual information to each COPD patient for controlling episodic dyspnea.

Keywords: COPD, Dyspnea, Self-management, Teaching & Strategies.

Introduction:

Chronic obstructive pulmonary disease COPD is a persistent illness marked by increasing tissue damage and airflow restriction. Structural lung alterations due to chronic inflammation from repeated exposure to harmful particles or gases most commonly cigarette smoke. The disease often presents with symptoms the most significant is dyspnea (Shakeel et al., 2023).

The most prevalent clinical sign of COPD is dyspnea. In addition, symptoms worsen sleep quality, impairment of the ability to perform activities of daily living and physical activities, and are linked to a reduction in health-related quality of life. (Mendes et al., 2022).

Many patients adopt a sedentary lifestyle to avoid dyspnea, which predictably results in significant skeletal muscle deconditioning, social isolation, and its negative psychological consequences (Cazorla et al., 2023).

The self-management and coping strategies are strategies to deal with episodes of dyspnea. Decreased physical effort, mental and psychological strategies, breathing exercises and positions, air and oxygen, medications and medical devices, and environmental

strategies were some of its components (Liou et al., 2023).

Significance of the study

It has been observed by the researcher at chest department at Assiut University Hospital. Most of the hospitalized COPD patients suffer from dyspnea and have inadequate knowledge and skills about their self-management strategies that relieve episodic breathlessness. In 2021, (200) patients were admitted chest department at Assiut University Hospital (Assiut University Hospital Statistical Records, 2021), It is expected that this study could help in providing self-management teaching strategies for COPD patients to improve dyspnea.

The aim of the study

To evaluate the effect of self-management teaching strategies on chronic obstructive pulmonary disease patients with dyspnea.

Hypothesis

The following research hypothesis was developed to achieve the study's goal:

Dyspnea will be improved after applying self-management strategies.

Patients & Methods

Research design: Quasi-experimental research design was utilized in this study.

Setting: Chest department and outpatient clinic at Assiut University Hospital.

Subjects: A purposive sample of (40) adult patients during the period from April 2023 to October 2023.

The sample was calculated based on the J power of the previous research.

Inclusion criteria: Adult conscious patients diagnosed with COPD based on pulmonary function test post-bronchodilator $FEV_1/FVC < 0.7$, admitted at chest department and outpatient clinic at Assiut University Hospital, age range between 18 – 65 years.

Exclusion criteria: Patients suffering from interstitial lung disorders, lung cancer, bronchiectasis, asthma, congestive heart failure, and pulmonary TB.

Tools: The following research tools were used to gather data:

Tool (I): Patient assessment sheet: It consisted of two main parts:

Part (1): Demographic data of the patients include Patient's code, age, sex, marital status, occupation, level of education, and residence.

Part (2): Patients' Medical Assessment: This part was utilized to assess smoking status (smoker or nonsmoker, cigarettes or goza), smoking index degree (mild, moderate, severe) and exposure to chemicals or polluted air or fumes, full medical history, comorbidity, oxygen saturation on admission and medication (inhalers).

Tool (II): Modified Medical Research Council (mMRC) Scale:

To give patients with COPD information regarding the severity of their dyspnea based on their perceptions of the illness, the British Medical Research Council created this scale (Williams, 2017).

Scoring system:

The mMRC scale is a self-rating tool to measure the degree of disability that breathlessness poses on day-to-day activities on a scale from 0 to 4. This tool was used pre- and post-teaching the patients about (Self-Management Strategies for Episodic Breathlessness) to measure the effect of breathlessness on everyday life. It consists of the following items:

- 0= no breathlessness except on strenuous exercise;
- 1= shortness of breath when hurrying on the level or walking up a slight hill;
- 2= walks slower than people of the same age on the level because of breathlessness or has stop to catch their breath when walking at their own pace on the level;
- 3=stops for breath after walking ~100 m or after a few minutes on the level;
- 4= too breathless to leave the house, or breathless when dressing or undressing.

Tool (III): Dyspnea Management Questionnaire (DMQ56):

Adults with COPD who experience dyspnea can evaluate their psychological and behavioral reactions to it using the Dyspnea Management Questionnaire (DMQ). The DMQ model was theoretically constructed from five factors: dyspnea intensity, dyspnea anxiety, activity avoidance, activity self-efficacy and strategy satisfaction.

Dyspnea intensity: The level of dyspnea experienced when engaging in self-care, mobility, home management, community, leisure, and social activities is measured using 12 items.

Dyspnea anxiety: the intensity of breathlessness-related anxiety symptoms is measured using 16 questions.

Activity avoidance: the degree to which anxiety feelings associated with dyspnea lead people to avoid everyday activities is measured using 15 items.

Activity self-efficacy: an individual's perceived confidence in their ability to control dyspnea while participating in an activity is measured using six items.

Strategy satisfaction: this is a seven-item assessment of the individual's proficiency with dyspnea management strategies (Norweg et al., 2011).

Scoring system:

A seven-point Likert scale, ranging from 0 to 6, is used in the DMQ; higher scores indicate improved dyspnea-related function. For example, the DMQ's activity avoidance scale ranges from (6), which means "never," to (0), which means "all the time." The raw values of the items in each subscale are added together, and the resulting mean score is divided by the total number of items in the subscale.

Validity & Reliability:

- Five experts from Assiut University's academic medical and nursing Professors evaluated the tool's content validity.
- The Cronbach test was used to examine the tools' internal consistency, which indicated their reliability (0.73).

Self-Management Strategies for Dyspnea (Arabic booklet):

The researcher created it after reviewing pertinent literature and researcher experience to provide COPD patients with needed self-management and coping strategies to manage episodes of breathlessness and minimize the incidence of exacerbation and complications. The self-management strategies booklet included knowledge about:

Reduction of Physical Exertion: There are several ways to reduce physical exertion including planning activities, taking breaks, using assistive devices such as (canes, walkers, and wheelchairs), asking for help, and reducing physical exertion in different everyday activities such as (getting dressed, bathing, cooking, cleaning and shopping). (Xiang et al., 2022).

Cognitive and Psychological Strategies: Including box breathing, guided imagery, relaxation techniques, and progressive muscle relaxation.

Breathing Techniques and Positions: Include; controlled coughing or huff cough, diaphragmatic breathing, purse-lip breathing, deep breathing, and coordinated breathing and positions including; standing leaning forward, standing with back support, sitting leaning forward, sitting leaning forward at a table, and high side-lying.

Air and Oxygen

Including; long-term oxygen therapy, delivery devices for oxygen therapy, using oxygen at home, and handheld fans.

Drugs and medical devices

Including; dry powder inhalation, pressurized metered-dose inhalers, nebulizers, compressed oxygen, oxygen concentrator, and ventilator support.

Environmental strategies

Including; smoking cessation, control of obesity, alcohol cessation, good nutrition, and avoiding exposure to harmful particles.

These strategies were developed in an Arabic booklet containing colorful illustrations, pictures, and instructions given to the patients after giving a full explanation of them.

Methods

Administrative approval: The chairman of the Assiut University Hospital's chest department and outpatient clinics officially gave their consent for the study to be carried out. Patients were asked to provide their oral consent for voluntary participation after being informed about the nature and goals of the study.

Ethical considerations: The Faculty of Nursing Ethical Committee granted ethical approval in November 2022, No. 505.

Pilot study: Ten percent of the sample (4 patients) participated in a pilot trial in a predetermined setting to assess the tools' applicability and clarity. According to this pilot study, the required modifications were made. Those patients who were involved in the pilot study were not included in the study.

Data collection: The following phases were included in the data-gathering process:

Assessment phase:

- To get oral agreement for study participation, the researcher conducted interviews with patients in the chest department and outpatient clinic.
- A patient assessment sheet (Tool I, part I, II) was used which was concerned with the patient's demographic data (patient's code, age, sex, marital status, occupation, level of education, and residence) and patient medical assessment (full medical history, prescribed medication (inhalers), comorbidity, oxygen saturation on admission,

smoking status (smoker or nonsmoker, cigarettes or goza), smoking degree (mild, moderate, severe), exposure to chemicals, polluted air, fumes.

- Tool (II) Modified Medical Research Council Dyspnea Scale (mMRC) was used to assess the patients for the degree of baseline functional disability due to dyspnea before teaching them the coping strategies.
- Tool (III) Dyspnea Management Questionnaire (DMQ56) was used to measure the psychosocial and behavioral responses to dyspnea and the effect of lung rehabilitation and change over time in patients with COPD before teaching them the coping strategies.

Implementation phase

- The researcher met every patient individually in two sessions, 3 patients in each session or at their convenience received instructions.
- The 1st session in the first interview includes theoretical instructions to give patients the necessary guidance and information about particular techniques for managing episodes of dyspnea. The second session on the second day includes practical application of the strategies.
- Sessions last 35 to 50 minutes each. There were fifteen to twenty minutes for discussion and comments following each session.
- To make sure the patients understood, instruction was reinforced based on their requirements.
- To follow instructions, each patient received a hard copy of the instructional booklet. The researcher visualized the educational materials for the patients using laptops, diagrams, and illustrations.
- The researcher monitors all patients weekly through the outpatient clinic, phone, and WhatsApp to ensure compliance with strategy management for 3 months.

Evaluation phase

After three months of teaching the strategies, every patient was evaluated for the effect of dyspnea management strategies on dyspnea severity and management using tools (II, III).

Statistical design:

The SPSS version 23 statistical software applications were used to evaluate, code, analyze, and tabulate data. Frequencies and percentages were used as descriptive data. Using the Chi-square (χ^2) test, the relationship between two or more qualitative variables was examined. The qualitative data were presented as percentages (n, %) and numbers. The quantitative data's mean and standard deviation (SD) were applied. The direction and strength of the linear correlations between two sets of data are evaluated using coefficients. P-value < 0.05 was determined to be the significance.

Results

Table (1): Demographic data of studied patients (n =40)

Variables	N=40	%
Age (years) (mean ±SD):	58.87±6.38	
Sex:		
Male	27	67.5
Female	13	32.5
Marital status:		
Single	-	-
Married	35	87.5
Widow /widower	5	12.5
Divorced	-	-
Educational level:		
Illiterate	-	-
Read and write	34	85.0
Primary	1	2.5
Secondary	5	12.5
University	-	-
Residence:		
Rural	38	95.0
Urban	2	5.0
Occupation:		
Farmer	12	30.0
Housewife	13	32.5
Office work	1	2.5
Skilled worker	8	20.0
Retired	6	15.0

Data expressed as frequency (percentage).

Table (2): Distribution of risk factors among studied patients (n=40)

Variables	Yes	
	n	%
Current Cigarette smoker :	21	52.5
"<200 mild"	3	7.5
"200-400 moderate"	1	2.5
">400 severe"	17	42.5
Current Goza Smoker :	6	15.0
Mild <2 korsi <2 year	0	0
Moderate>2 korsi <2	0	0
Severe >2 korsi >2 year	6	15.0
Nonsmokers	13	32.5
Exposure to chemicals polluted air dust or fumes	40	100.0

Data expressed as frequency (percentage).

Table (3): Clinical manifestation, comorbidities, use of inhalation therapy and baseline oxygen saturation among the studied patients (n =40).

Variables	Yes	
	N	%
Clinical manifestation:		
Cough	37	92.5
Dyspnea	40	100
Expectoration	36	87.5
Hemoptysis	5	12.5
Wheezing	14	35.0
Comorbidities:		
Diabetes	11	27.5
Hypertension	14	35.0
Inhalation therapy	40	100.0
Oxygen saturation on admission(mean ±SD):	87.15±5.37%	

Data expressed as frequency (percentage).

Table (4): Distribution of dyspnea severity (mMRC) for studied patients before and after applying strategies (n =40).

Variables: (mMRC)	Pre (N=40)		Post (N=34)		p-value
	n	%	n	%	
Grade 0	0	0	7	9.5	0.001**
Grade I	6	8.1	3	4.1	
Grade II	4	5.4	6	8.1	
Grade III	6	8.1	17	23.0	
Grade IV	24	60.0	1	1.4	

Chi-Square Tests ******(highly statistical significant P value ≤ 0.01)

Table (5): Total mean of DMQ score among studied patients before and after applying strategies (n =40).

Variables	Follow up	N	Mean	Std. Deviation	p-value
Dyspnea Intensity Score 0-72	pre	40	18.2250	15.16150	.0001**
	post	34	47.3824	17.79005	
Dyspnea anxiety Score 0-96	pre	40	26.7750	16.75845	.0001**
	post	34	62.8235	21.26666	
Activity avoidance Score 0-90	pre	40	16.6500	14.38937	.0001**
	post	34	51.7647	18.96098	
Activity self-efficacy Score 0-36	pre	40	7.9250	6.99226	.001**
	post	34	21.2647	7.81726	
Strategy satisfaction Score 0-42	pre	40	11.5750	4.40796	.0001**
	post	34	28.5882	7.53222	
Total 0-336	pre	40	81.1500	51.25229	.001**
	post	34	211.8235	69.90967	

Independent t. Test ******(highly statistical significant P value ≤ 0.01)

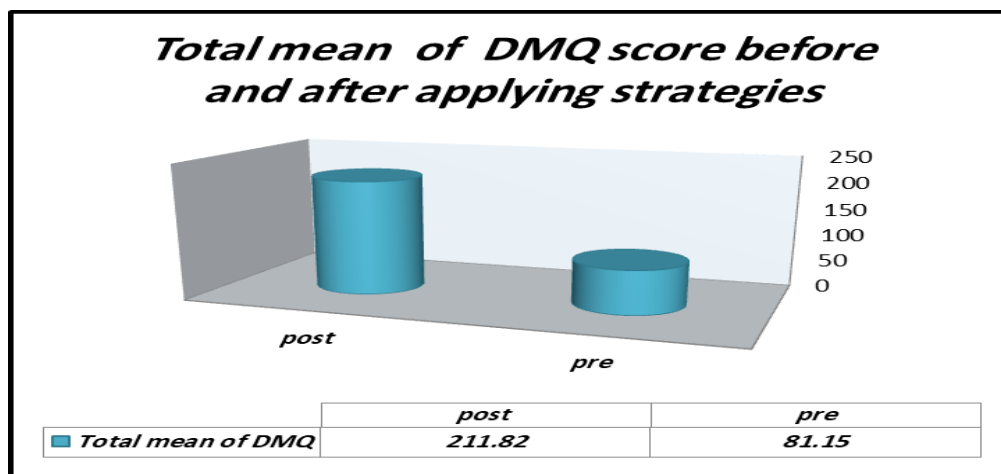


Figure (1): Total mean of dyspnea management questionnaire (DMQ) score among studied patients before and after applying strategies.

Table (1): Shows that; the mean age of the studied patients was 58.87±6.38 years. Most of the patients were males 67.5%, the majority of them were married, read and write, living in rural areas 87.5%, 85% and 95%, respectively. About two quarters of patients were farmers and house wives with 30%, 32.5% respectively.

Table (2): Reveals that; more than half of the patient's participants were current cigarette smokers 52.5%, and the highest percentage of them were severe Smoker 42.5%. And nearly 15% were severe

current goza smokers. All studied patients had been exposed to chemicals, polluted air, and dust 100.0%.

Table (3): As regards the clinical presentation of symptoms; the majority of patients had cough 92.5%, All studied patients had dyspnea. The majority of them had expectoration 87.5%, all of the studied patients used inhalers 100%, more than one-quarter of patients complained of hypertension, and the mean oxygen saturation on admission was 87.15±5.37%.

Table (4): Reflects that; there was a statistically significant decrease in mMRC found post-intervention compared with that pre-intervention

which means the strategies are effective in reducing dyspnea severity.

Table (5): Shows that, for all items of the dyspnea management questionnaire (DMQ), there was a statistically significant difference between the pre- and post-application of the techniques. This indicates that the strategies are successful in lessening the severity of the dyspnea and improving quality of life.

Figure (1): The chart shows the total mean of DMQ scores among studied patients before and after applying strategies. Pre- and post-strategies application showed a statistically significant difference that improved patients' quality of life in all domains of the dyspnea management questionnaire (DMQ) (dyspnea intensity, dyspnea anxiety, activity avoidance, activity self-efficacy, and strategies satisfaction).

Discussion

The prevalent and curable condition known as chronic obstructive pulmonary disease (COPD) is marked by increasing tissue damage and airflow restriction. It is associated with structural lung changes due to chronic inflammation from prolonged exposure to harmful particles or gases most commonly cigarette smoke. Reduced lung recoil and airway constriction are the results of chronic inflammation. Cough, dyspnea, and sputum production are common signs of the illness. Symptoms can range from being asymptomatic to respiratory failure. (Kılıç et al., 2023).

Regarding demographic characteristics; More than half of patients were males, married, their ages were between fifty and sixty years. According to the researcher, this could be explained by the fact that age may reflect the total of all lifetime exposures to COPD risk factors and that old people may not have the immunity to fight the disease by the time the condition worsens, in contrast to young people. The occurrence of COPD is also thought to increase with age due to physiological changes that occur at the alveoli.

This might explain the age-related changes in the respiratory system that are associated with COPD, such as decreased lung functions, increased gas trapping, lung elasticity loss, and expansion of the distal air gaps. These findings are in line with research conducted by Helmy et al., (2022), which found that over half of the patients with chronic obstructive lung disease were in the fifty to sixty-year age range. These findings are inconsistent with the study conducted by Sulku et al., (2019); Ceyhan et al., (2022); that study found more than half of the patients were between the ages of sixty and seventy.

Regarding sex; More than two thirds of patients were male and more than three quarters of them were

married. According to the researcher, males are more exposed to risk factors, mainly cigarette smokers and frequent occupational exposure to an irritating workplace. The present findings are consistent with the research carried out by Suleymanova & Baranova (2020) & Helmy et al. (2022), which revealed that more than two thirds of patients were male and more than three quarters of them were married. These findings are inconsistent with the research done by Sulku et al., (2019) who found that over half of the patients they looked at were female.

Regarding educational level; over three-quarters of patients possess reading and writing skills. According to the study, this happened because most of patients live in rural areas and people live in rural don't care about education unlike urban. Also, Patients with low education have lack of health awareness and knowledge about COPD and facing difficulties in managing their dyspnea properly. These findings are consistent with research conducted by Suerdem et al., (2020) which found that more than three quarters of the patients had only completed high school. However, in line with the findings of the Arjun et al. (2019) study, which showed that around one-third received postgraduate and university training.

As regards residence; According to the current study, most of the patients were from rural areas. From the perspective of the researcher, this might be caused by air pollution, poor housing cleanliness, animal and bird breeding, high crowding index and a lack of health awareness and understanding about COPD therapy. Also, rural populations may have more COPD-related issues due to more people smoking, increased exposure to secondhand smoke, less access to smoking cessation programs compared with people living in urban area. All of these are major risk factors for COPD. This is consistent with the findings of Mohamed et al. (2022), who discovered that over half of the patients were from rural areas. However, this finding contradicts that of Hamad et al. (2022), who discovered that over half of the patients came from cities.

As regards Occupation; According to the current results, one-third of them worked in agriculture. The primary risk factors for COPD, according to Mishra et al. (2023), include smoking and prolonged exposure to lung irritants from the environment, such as dust, air pollution, chemicals, fumes, and secondhand smoke. Every patient was subjected to dust from agriculture, air pollution, and occupational and environmental risks. In addition, inadequate housing, education, and nutrition are all significant risk factors for the onset of COPD. (Hamad et al., 2022) who observed that one-third of them worked in agriculture, corroborated this conclusion.

Concerning chief complaints; the current findings showed that every patient under study had dyspnea, with the majority of them also coughing up phlegm. These symptoms are brought on by growing airflow restriction and airway inflammation, which are mostly brought on by cigarette smoking. This result is supported by **Almuzaini et al., (2023)** who reported that chest wheezing, cyanosis, weariness, a chronic cough, and recurrent respiratory infections are all linked to shortness of breath, which is a typical sign of lung illness.

Regarding risk factors, the findings of the current study showed that smokers made up the majority of the patients under investigation. According to the study, this is because men are more likely than women to smoke in our culture. As claimed by **Venkatesan (2024)**, one major environmental risk factor for COPD is cigarette smoking. Compared to non-smokers, cigarette smokers had a higher yearly rate of decrease in FEV1, a higher incidence of respiratory symptoms and abnormalities related to lung function, and a higher death rate from COPD. This result was consistent with the findings of **El Sayad et al. (2020) & Gomaa et al. (2020)**, who noted that the majority of the patients under study were smokers.

The Modified Medical Research Council Dyspnea Scale (mMRC) (1986) were used to measure shortness of breath grades before and after strategies implementation. The study's findings showed that, three months after the strategies implementation, there was a significant drop in mMRC post-intervention compared to pre-intervention. According to the researcher, there is evidence of the benefits of using self-management techniques to reduce dyspnea and enhance the quality of life for COPD patients. This result was consistent with **Ceyhan et al. (2022)** findings, which stated that patients' dyspnea severity decreased as shown by statistically significant mMRC scores.

Regarding Self-management strategies; the current study's findings showed that patients who received self-management training had observed significant improvement in their health status and quality of life, which is a key outcome criterion for COPD therapies. According to the researcher, patients' ability to control their COPD improved as a result of increased their awareness of its management.

Also, correct inhaler utilization, using different positions to reduce work of breathing, practicing relaxation techniques to reducing anxiety, tension and dyspnea, correct use of long term oxygen therapy, medications adherence as prescribed and application of breathing exercises may also increase the volume that patients inhale before inhaler drug. It supported the fact of the implementation of COPD management

strategies had a positive influence on patients' levels of dyspnea which in turn improved their quality of life in all dimensions (dyspnea intensity, dyspnea anxiety, activity avoidance, activity self-efficacy and strategies satisfaction).

This finding was in agreement with **Hasanpour et al.,(2022), Zhang et al., (2022) & Liou et al.,(2023)** who explained that; three months after the intervention, the health status in the control and intervention groups was statistically significant, and the health status was better in the intervention group that received the self-management program compared to the other group. This study looked at the impact of a self-management program on health status and dyspnea severity among patients with COPD. Also, revealed that self-management intervention might lessen the dyspnea of individuals with COPD. Also, several studies in contrast with the present study in which self-management therapies did not enhance the health status of individuals with COPD.

For instance, in a study by **Schrijver et al., (2022)** showed that Self-management interventions did not reach a clinically meaningful improvement. **Tabak et al., (2014), Talboom-Kamp et al.,(2017), Russo et al.,(2015) & Disler et al.,(2012)** Studied the impact of a self-management program on COPD exacerbations and the impact of a self-management program on health status in primary care. The findings indicated that the program did not affect improving the health status of these patients due to several factors, including social factors like social isolation, loss of social role, social support, socioeconomic status, health literacy, individual perception of life, spirituality, and religion, as well as factors related to the health system like communication with healthcare personnel. Psychological factors were included in the study as well.

Finally, the study's findings demonstrated how self-management techniques could reduce the dyspnea of patients with COPD and improve the health status .

Conclusions

Based on the results of the present study, it can be concluded that

- After three months of applying the strategies a significant decrease in dyspnea severity was found post-intervention compared with that pre-intervention.
- Observed significant improvement in health status and quality of life after applying the strategies compared with pre-applying the strategies.

Recommendations

The following recommendations were made in light of the study's findings:

- Provide booklet with sufficient relevant written and visual information to each COPD patient to support

the teaching of self-management techniques for controlling episodic dyspnea.

- Requires more research and studies with a larger sample size, a proper experimental design, and a qualitative approach to highlight the impact of self-management techniques on dyspnea severity and health status. These studies will add to our expertise and knowledge in this area.

Limitations of the study:-

- Because the sample was confined to the chest department and outpatient clinic at Assiut University Hospital, the results' generalizability is limited. (Limited geographical area in the Arab Republic of Egypt).
- Technical malfunction of the pulmonary function device during the period of research and after repairing the device most patients were unable to perform the test due to tachypnea.
- During the research period, six patients missed the study; four patients died and two patients withdrew from the study.

References

- **Almuzaini, A., Algeffari, M., Alsohaibani, A., Almutlaq, L., Alwehaibi, R., Almuzaini, R., & Mahmood, S. (2023):** Awareness of Chronic Obstructive Pulmonary Disease and Its Risk Factors Among the Adult Population of the Qassim Region, Saudi Arabia. *Cureus*, 15(9), e44743. <https://doi.org/10.7759/cureus.44743>
- **Arjun, P., Nair, S., Jilisha, G., Anand, J., Babu, V., Moosan, H., & Kumari, A. (2019):** Assessing health-seeking behavior among Asthma and COPD patients in urban South India. *Journal of family medicine and primary care*, 8(8), 2714–2719. <https://doi.org/10.4103/jfmprc.jfmprc.485.19>
- **Cazorla, S., Busegnies, Y., D'Ans, P., Héritier, M., & Poncin, W. (2023):** Breathing Control Exercises Delivered in a Group Setting for Patients with Chronic Obstructive Pulmonary Disease: A Randomized Controlled Trial. *Healthcare (Basel, Switzerland)*, 11(6), 877. <https://doi.org/10.3390/healthcare11060877>
- **Ceyhan, Y., & Tekinsoy Kartın, P. (2022):** The effects of breathing exercises and inhaler training in patients with COPD on the severity of dyspnea and life quality: a randomized controlled trial. *Trials*, 23(1), 707. <https://doi.org/10.1186/s13063-022-06603-3>
- **Disler, R., Gallagher, R., & Davidson, P. (2012):** Factors influencing self-management in chronic obstructive pulmonary disease: an integrative review. *International journal of nursing studies*, 49(2), 230–242. <https://doi.org/10.1016/j.ijnurstu.2011.11.005>
- **Elsayad, N., El-Hameed, A., Sadek, H., Ramadan, E., & Mahmood, A. (2020):** Home Health Care Intervention Regarding Quality of Life for Elderly Patients with Chronic Obstructive Pulmonary Disease. *Journal of Nursing Science Benha University*, 1(2), 1-21.
- **Gomaa, W., Mohamed, H., & Morad, A. (2020):** Assessment lifestyle for patients with chronic obstructive pulmonary disease. *Egyptian Journal of Health Care*, 11(2), 273-285.
- **Hamad, A., Abdelmoniem, A., & Saleh, M. (2022):** Effect of Supportive Nursing Care on Symptoms Severity and Quality of Life for Patients with Chronic Obstructive Pulmonary Disease. *Zagazig Nursing Journal*, 18(2), 126-145.
- **Hasanpour Dehkordi, A., Heidari-Beni, F., Reiszadeh, I., Hosseini, M., & Khajeh Ali, F. (2022):** Effect of Self-Management Program on Health Status and Dyspnea in Patients with Chronic Obstructive Pulmonary Disease. *Tanaffos*, 21(1), 96–103.
- **Helmy, M., Sobieh, H., & Nabil, S. (2022):** Health Needs for Patients with Chronic Obstructive Pulmonary Disease: Suggested Self-Management Guidelines. *Egyptian Journal of Health Care*, 13(4), 40-51.
- **Kılıç, Z., Karadağ, S., & Tutar, N. (2023):** The Effect of Progressive Relaxation Exercises on Dyspnea and Anxiety Levels in Individuals With COPD: A Randomized Controlled Trial. *Holistic nursing practice*, 37(1), E14–E23. <https://doi.org/10.1097/HNP.0000000000000563>
- **Liou, H., Lai, Z., Huang, Y., Chu, W., Tsai, Y., Chen, M., & Tsai, P. (2023):** The effectiveness of an unsupervised home-based pulmonary rehabilitation with self-management program in patients with chronic obstructive pulmonary disease. *International journal of nursing practice*, 29(6), e13185. <https://doi.org/10.1111/ijn.13185>
- **Mendes X., Lanza G., Aliane F., de Souza, G., & Pereira L. (2022):** Effects of Home-Based Pulmonary Rehabilitation on Dyspnea, Exercise Capacity, Quality of Life and Impact of the Disease in COPD Patients: A Systematic Review. *COPD*, 19(1), 18–46. <https://doi.org/10.1080/15412555.2021.2020234>
- **Mishra, J., Acharya, S., Taksande, A., Prasad, R., Munjewar, P., & Wanjari, M. (2023):** Occupational Risks and Chronic Obstructive Pulmonary Disease in the Indian Subcontinent: A Critical Review. *Cureus*, 15(6), e41149. <https://doi.org/10.7759/cureus.41149>
- **Mohamed, N., Ahmed, A., & Elayari, O. (2022):** Quality of sleeping among Patients with Chronic Obstructive Pulmonary Disease. *International*

- Egyptian Journal of Nursing Sciences and Research, 2(2), 606-618.
- **Norweg, A., Ni, P., Garshick, E., O'Connor, G., Wilke, K., & Jette, A. (2011):** A multidimensional computer adaptive test approach to dyspnea assessment. Archives of physical medicine and rehabilitation, 92(10), 1561–1569. <https://doi.org/10.1016/j.apmr.2011.05.020>
 - **Russo, R., Coultas, D., Ashmore, J., Peoples, J., Sloan, J., Jackson, B., Uhm, M., Singh, K., Blair, S., & Bae, S. (2015):** Chronic obstructive pulmonary disease self-management activation research trial (COPD-SMART): results of recruitment and baseline patient characteristics. Contemporary clinical trials, 41, 192–201. <https://doi.org/10.1016/j.cct.2015.01.018>
 - **Schrijver, J., Lenferink, A., Brusse-Keizer, M., Zwerink, M., van der Valk, P., van der Palen, J., & Effing, T. (2022):** Self-management interventions for people with chronic obstructive pulmonary disease. The Cochrane database of systematic reviews, 1(1), CD002990. <https://doi.org/10.1002/14651858.CD002990.pub4>
 - **Shakeel, I., Ashraf, A., Afzal, M., Sohal, S., Islam, A., Kazim, S., & Hassan, M. (2023):** The Molecular Blueprint for Chronic Obstructive Pulmonary Disease (COPD): A New Paradigm for Diagnosis and Therapeutics. Oxidative medicine and cellular longevity, 2023, 2297559. <https://doi.org/10.1155/2023/2297559>
 - **Suerdem, M., Gunen, H., Akyildiz, L., Cilli, A., Ozlu, T., Uzaslan, E., Abadoglu, O., Bayram, H., Cimrin, A. H., Gemicioglu, B., & Misirligil, Z. (2020):** Demographic, Clinical and Management Characteristics of Newly Diagnosed COPD Patients in Turkey: A Real-Life Study. International journal of chronic obstructive pulmonary disease, 15, 261–267. <https://doi.org/10.2147/COPD.S211838>
 - **Suleymanova, A., & Baranova, I. (2020):** The relationship between vitamin D deficiency and the main characteristics of COPD patients. European Respiratory Journal 2020 56: 2445; DOI: 10.1183/13993003.congress-2020.2445
 - **Sulku, J., Janson, C., Melhus, H., Malinovschi, A., Ställberg, B., Bröms, K., Högman, M., Lisspers, K., Hammarlund-Udenaes, M., & Nielsen, E. (2019):** A Cross-Sectional Study Assessing Appropriateness Of Inhaled Corticosteroid Treatment In Primary And Secondary Care Patients With COPD In Sweden. International journal of chronic obstructive pulmonary disease, 14, 2451–2460. <https://doi.org/10.2147/COPD.S218747>
 - **Tabak, M., Brusse-Keizer, M., van der Valk, P., Hermens, H., & Vollenbroek-Hutten, M. (2014):** A telehealth program for self-management of COPD exacerbations and promotion of an active lifestyle: a pilot randomized controlled trial. International journal of chronic obstructive pulmonary disease, 9, 935–944. <https://doi.org/10.2147/COPD.S60179>
 - **Talboom-Kamp, E., Verdijk, N., Kasteleyn, M., Harmans, L., Talboom, I., Looijmans-van den Akker, I., van Geloven, N., Numans, M., & Chavannes, N. (2017):** The Effect of Integration of Self-Management Web Platforms on Health Status in Chronic Obstructive Pulmonary Disease Management in Primary Care (e-Vita Study): Interrupted Time Series Design. Journal of medical Internet research, 19(8), e291. <https://doi.org/10.2196/jmir.8262>
 - **Venkatesan P. (2024):** GOLD COPD report: 2024 update. The Lancet. Respiratory medicine, 12(1), 15–16. [https://doi.org/10.1016/S2213-2600\(23\)00461-7](https://doi.org/10.1016/S2213-2600(23)00461-7)
 - **Williams N. (2017):** The MRC breathlessness scale. Occupational medicine (Oxford, England), 67(6), 496–497. <https://doi.org/10.1093/occmed/kqx086>
 - **Xiang, X., Huang, L., Fang, Y., Cai, S., & Zhang, M. (2022):** Physical activity and chronic obstructive pulmonary disease: a scoping review. BMC Pulmonary Medicine, 22(1), 301. <https://doi.org/10.1186/s12890-022-02099-4>
 - **Zhang, H., Hu, D., Xu, Y., Wu, L., & Lou, L. (2022):** Effect of pulmonary rehabilitation in patients with chronic obstructive pulmonary disease: a systematic review and meta-analysis of randomized controlled trials. Annals of Medicine, 54(1), 262–273. <https://doi.org/10.1080/07853890.2021.1999494>

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