Effect of Supportive Nursing Care on Symptoms Severity and Quality of Life for Patients with Chronic Obstructive Pulmonary Disease.

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 Abstract:

Background: Chronic obstructive pulmonary disease (COPD) industriously influences the quality of life(QoL) with impairment of the physiological, psychosocial functions. **Aim of the study:** This study aimed to evaluate the effect of supportive nursing care on symptoms severity and QoL for patients with COPD. **Subjects and Methods: Research design:** a quasi-experimental design was used. **Setting:** The study was conducted at Chest Department and Chest Outpatient Clinic at Zagazig University Hospitals . **Subjects**: a purposive sample of forty five patients with COPD were included in this study. **Tools of data collection**: Patients' assessment questionnaire, Patients' observational checklists, COPD symptoms severity assessment scale, and the St George's quality of life respiratory questionnaire**. Results:** There were a lack in patients' knowledge, practice and QoL regarding COPD pre intervention, which increased in post and follow-up phases of intervention, with a statistically significant difference. Moreover, there was increase in COPD patients' symptoms severity before intervention, which decreased in post and follow-up phases, with a statistically significance difference. **Conclusion:** Patients with COPD who received supportive nursing care reported a reduction in symptoms severity and an improvement in QOL. **Recommendations:** Supportive nursing care should be implemented on a regular basis to improve COPD patients' knowledge, practice, and symptoms severity. Supportive nursing care training programs for nurses caring for COPD patients should be maintained.

Key words:, Supportive nursing care, Symptoms severity. Quality of life, chronic obstructive pulmonary disease,

Introduction

Chronic obstructive pulmonary disease (COPD) is characterized by limitation of airflow that isn't completely reversible, commonly progressive and correlating with abnormal inflammatory responses by the lungs tissues to detrimental particles or gases. This airflow limitation is a result from small airways disease (obstructive bronchiolitis) and parenchymal destruction (emphysema) that contributes to the disease to varying degrees, relying on the individual. Chronic inflammation reduces the ability of the airways to be open during expiration [(1)].

Progressive and chronic shortness of breath, wheezing, sputum production, cough, and chest tightness are common symptoms of COPD. Besides pulmonary changes and limitation of airflow, COPD has comorbidities and systemic effects. These systemic effects involve nutritional abnormalities, musculoskeletal dysfunction and weight loss [(2)]. Chronic obstructive pulmonary disease (COPD) has part of the United Nations' 2030 Agenda and the WHO Global Action Plan for Prevention and Control of Non-communicable Diseases for Sustainable Development. Globally, COPD is considered as the 3rd leading cause of death, killing 3.23 million individuals in 2019. Over eighty percent of these deaths happen in low- and middle-income nations [(3)]. In Egypt, COPD was highlighted as the major public health problem; its prevalence in high-risk groups was estimated to be approximately ten percent according to GOLD [(4)].

The most common risk factors for COPD are smoke, tobacco, indoor air pollution, occupational exposure and

alpha1-antitrypsin deficiency. The GOLD guidelines recommend screening for COPD in individuals with shortness of breath, chronic cough, or sputum production, particularly those with risk factors as smoking[5]. Goals of managing stable COPD include: preventing disease progression, increasing exercise tolerance, reducing the severity and frequency of exacerbations, promoting quality of life, enhancing lung function and general health, improving patients' symptoms such as dyspnea, cough, and fatigue, and reducing mortality rate [6].

Quality of life (QoL) is an important area to measure the influence of chronic diseases. The QoL concept is broad. It is influenced by physical health, personal mental state, personal beliefs, degree of independence, social relationships and their relationship to the environmental characteristics [7]. COPD severely affects quality of life, with poor physical, social, and emotional functioning, leads to disability in everyday life, so patients always need medical help[8].

The prevalence of depression and anxiety in patients with COPD is higher than the general inhabitants. Mental health problems in COPD are contributed with decreased the ability to adjust with the physical dimensions of the disease, decreased QoL, decreased lung function, frequent and longer hospital stays, decreased medication adherence, and decreased compliance to rehabilitation and other treatment options [9]. The nurse has an effective role in management of COPD by providing education, guidance, support, care management, illness prevention and control, as they can enhance the self-care to improve QoL[10].

As a result of nature of the nursing profession, nurses have much more regular and ongoing interactions with their patients than all the other medical personnel. As a result, their performance may influence health satisfaction and treatment efficacy. One of the most important roles of nurses is to provide supportive care, which is also one of the most important sources of support for both patients and their families throughout illness and stress. Supportive care is a collection of both general and specific therapeutic approaches delivered by nurses to patients in order to treat and support them [8].

Significance of the study:

Chronic obstructive pulmonary disease (COPD) put a massive burden on the patients related to physical symptoms, decreased social and mental wellbeing that severely limits their QoL. The disease nature and exacerbations lead patients to attain health services frequently for acute and routine assessments through their COPD journey [11]. Primary care and acute care settings nurses will encounter patients with COPD on a regular, frequent basis and have a vital role to play in meeting their pschosocial and health needs [12]**.** So, this study aimed to evaluate the effect of supportive nursing care on symptoms severity and QoL for COPD patients.

Aim of the study:

This study aimed to evaluate the effect of supportive nursing care on symptoms severity and quality of life for patients with chronic obstructive pulmonary disease.

Considering the following objectives:

- Assess knowledge, practice, symptoms severity and QoL for COPD patients.

- Design and implement supportive nursing care for COPD patients.

- Evaluate the effect of supportive nursing care on patient's knowledge, practice, symptoms severity and QoL.

Research hypothesis:

H1: Implementing supportive nursing care will improve COPD patients' knowledge, practice than before.

H2: Patients with COPD will exhibit improvement in symptoms severity and QoL after implementation of supportive nursing care than before.

Subjects and Methods:

Research design:

A quasi-experimental design to achieve the study aim with one group pre, post and follow up phases.

Study Setting:

This study was carried out in the Chest Department, Zagazig University Hospitals, after that, it was completed in the Chest Out-Patients Clinics. The inpatient unit is located on the 6th floor of the Sednaoui Cardiothoracic Hospital, and consists of two wards (one for males and another for females). Each ward consists of 8 rooms and each room contains 3 beds. The Chest Outpatient Clinic is located on the 3rd floor of the Outpatient Clinic Building which is affiliated with Zagazig University Hospitals

Study Subjects:

Forty five individuals with COPD were included in this study as a purposive sample from the previous setting. Confidence level is 95% two side with power of study 95%, with drop out cases 15%. The sample size calculated using Open Epi is 45 patients.

The following formula was used:

$$n = [(Z_{\alpha/2} + Z_\beta)^2 \times \{(p1\,(1\text{-}p1) + (p2\,(1\text{-}p2))\}] / (p1 - p2)^2$$

Inclusions and exclusion Criteria

This study included COPD adult patients between the ages of 30 to 60 years old who were able to attend treatment and follow-up. Any patient who participated in a previous training program or received therapy for a mental disorder was excluded.

Tool of data collection:

Using the following four tools for collecting data:

Tool (I): Patients' assessment questionnaire; included two parts:

Part 1: Demographic characteristics and health history of patient.

It was designed by the investigators to assess the COPD patients' knowledge, including the following parts:

A: patients' demographic characteristics included seven questions (as age, sex, marital status, residence, educational level, occupation and monthly income).

B: Patient health history, contained questions about present history, past history, family history, and patient exposure to risk factors.

The scores of items were Yes=1 or No=0.

Part 2: Bristol COPD Knowledge Questionnaire (BCKQ): the researchers adapted this tool from White et al [13] and made their modification on it to be used in the study. It was used to evaluate COPD patients' knowledge all over the application of supportive nursing care. It contains thirteen domains, included five items in each (pathology, risk factors and symptoms, etiology of dyspnea, exacerbations, sputum, smoking, physical exercise, vaccinations, bronchodilators

therapy, antibiotics uses, oral and inhaled steroid therapy).

Scoring system: the wrong or no answer was given "zero" score and the correct one was marked "one" score and then these scores were counted for each patient. The overall score expressed as a percent. Patient's knowledge was deemed satisfactory at 60% or more and unsatisfactory at less than 60%, Altman [14].

Tool (II): Patients' observational checklists

It was adapted from The State of Queensland Health and Lung Foundation Australia, and Carette et al [15-16] and modified by the researchers for assessing patients' practice regarding relief of symptoms and quality of life pre, post the intervention and at follow up, including the following:

Breathing exercise (Diaphragmatic and Pursed lip breathing): was used to assess respiratory difficulties' and improving breathing patterns.

Inhaler techniques: was used to examine how the COPD patients adequately use a metered- dose or a dry powder inhaler with capsule.

Clearance of airway techniques (coughing and breathing exercises): It was utilized to examine patient's ability to clear secretions from the airways which is the most effective method to eliminate the infection risk for COPD patients.

Bodily position to minimize breathing difficulties (sitting, standing and laying positions): was utilized to assess the body's abilities to accommodate with dyspnea in various positions.

Scoring system:

The observed correct done item was assigned a "one" score, and the

incomplete or not done item was marked with a "zero" score, with "forty three" points for the overall score, which was divided as follows: "nine" grades for breathing exercise, "six" grades for airway clearance techniques, "eleven" grades for three body positions to reduce dyspnea, and "seventeen" grads for using inhaler, Mohamed et al [17]. Practice was deemed adequate if it scored 60% or higher and inadequate if it scored less than 60%, Ibrahim & Abd El-Maksoud [18].

Tool (III): COPD symptoms severity Assessment Scale: included three parts

Part 1: Medical Research Council Dyspnea Scale (MRC):

The researchers adopted it from O'Donnell et al [19] to determine patient's activities that produce dyspnea. The MRC is a five-point scale that ranks the severity of dyspnea associated with daily activities. It is graded from 0 to 4. The score for MRC are as follow "grade 0" refers to no breathing difficulties with activity, " grade 1 slight " refers that dyspnea slightly affects activities of patient when speeding up or walking up a slight hill, " grade 2 moderate " proves that dyspnea moderately affects patient's activities when walking slower than persons of the same age, " grade 3 severe " dyspnea severely influence activities, patient stops walking for breath after few minutes or about 90 meters walk. "Grade 4 very severe" dyspnea affects activities very severely; the patient feels breathless when dressing, undressing or leave the home. Number and percentage were calculated for patients in every level throughout the study.

Part 2: Short Form of the Profile of Mood States (POMS):

It was adopted by the researchers from Shelly, Michael and Jamie [20] then translated into Arabic to evaluate the

COPD patients' feelings that they had in the last week. Which represent mood on a 5-point scale; (0) not at all, (1) a little, (2) moderately, (3) quite a bit, and (4) extremely. It contains thirty seven items in six mood subscales. Depression had 8 items, vigor had 6 items, anger had 7 items, tension–anxiety had 6 items, confusion had 5 items and fatigue had 5 items.

Scoring system:

Each subscale scores were rated as; depression from zero to thirty two, anger from zero to twenty eight, tension from zero to twenty four, confusion from zero to twenty, Fatigue from zero to twenty and Vigor from zero to twenty four. **The total score** of "124" was calculated by counting depression, anger, tension, confusion, fatigue scores and subtracting vigor score.

Part 3: Pittsburgh Sleep Quality Index (PSQI):

This questionnaire was developed by Buysse et al [21], to evaluate the quality and patterns of sleep in adults. It includes a mix of Likert type and open-ended questions. It is used to differentiate "poor sleep" from "good sleep" by assessing seven domains; use of sleep medication in the previous month, sleep disturbances, habitual sleep efficiency, sleep duration, sleep latency, and subjective sleep quality. System of scoring; each of these seven areas of sleep is rated by the patient. Answers are scored on a 0 to 3 scale, with 3 representing the negative extreme on the Likert Scale. The scores of the elements were added together to produce a world score that ranged from (0 to 21). High scores indicate poor sleep quality. A "poor" sleeper has a global sum of "5" or higher.

Tool (VI): the St George's Respiratory quality of life Questionnaire for COPD:

It is a structured, self-administered questionnaire designed to assess COPD patients' health-related quality of life, Jones [22] inspired it, and it was translated into Arabic. It has four scores; symptoms, activity, impacts and the total scores.

The symptoms score (eight items); questions 1-7 asked about the frequency of respiratory symptoms to gauge the patient's assessment of their recent respiratory issues.

The activity Score: sixteen items include questions 8-14 addressed the patient's current condition as well as any disruptions to daily physical activity.

The impact score: twenty six items covered a wide range of psycho-social function disorders, and they also had strong correlations with daily dyspnea, exercise ability (6-minute walking test), and mood abnormalities (anxiety and depression). The impact score includes all of the disruptions that respiratory patients face on a daily basis.

The total score: took into account the disease's effects on overall health. On the scale of 0 to 100, where a score of 0 indicating no problems and a score of "100" indicating total impairment in QOL.

Validity and reliability:

Validity was performed by seven experts from the Medical-Surgical Nursing staff and the chest staff, who reviewed the tools for clarity, relevance, completeness, and understanding. Minimal changes were made, and then the tools were developed in the last format and tested for dependability. Cronbach's alpha coefficient was used to assess the reliability of the tools (r- 0.72).

Pilot study

It was conducted on five COPD patients to assess the appropriateness, the accuracy of the tools, and determine

the time required for each tool. The used tools were adjusted, and the final form was created. The pilot study patients were excluded from the study sample.

Field Work

Data was gathered from August 2021 to April 2022, for nine months; the researchers attended to the previously mentioned settings three days/ week. The study was conducted in three phases; assessment, implementation and evaluation:

Assessment Phase

During this phase, the researchers explained the purpose of the study and obtained patients' agreement to take part in this study. Then, the researchers assess the patients' base line data by filling out all the study tools for the pre-intervention evaluation; they took 30-45 minutes. The assessment phase was carried out by the researchers for each participant at inpatient departments.

Implementation Phase

Based on the findings of assessment phase, goals and expected outcomes were formulated.In this phase the supportive nursing care individually was provided by the researchers for each patient and in the presence of his relative during face-to-face interview at inpatient departments. The interview was carried out individually by applying the supportive nursing care through (direct nursing care based on patient's complaints and problems, involving the hospital routine of care, psychological support and nursing interventions along with his prescribed medications) to the patient (in a quiet calm environment). Providing necessary information relating to diagnosis, treatment and its side effects, how to prevent, control, or alleviate his burden of symptoms. Reinforcement and motivation were used to improve self-care and compliance with instructions during nursing care.

The teaching was given through modified lectures, discussions, demonstration and re-demonstration based on his or her needs and level of understanding supported by data show presentation, videos and the simplified Arabic booklet which was designed by researchers and including the following contents; function of respiratory system, COPD definition, causes, clinical manifestations, complications, diagnostic procedures and supportive nursing care including; nutrition, physical exercise, conserving energy, controlling breathing difficulties, preventing disease exacerbation and managing sleep disturbances problems . The patient had the time to ask questions, express his feelings and anxiety. Instruct the patient to adhere to medication and follow up visit schedule. The researchers interviewed each patient once a day for about 2-3 hours during their hospital stay, providing supportive nursing care during the morning, afternoon, or night shift. Each patient received the standard hospital routine of care and supportive nursing care. The researchers called each patient by telephony to ensure that he was following the provided instructions, and to support and reinforce him in doing so, post-discharge.

Evaluative phase

After one month following the implementation of the supportive nursing care, each patient in the study was evaluated and the tools were refilled for post intervention and after three months for the follow-up evaluation in the outpatient clinics.

Ethical considerations and administrative design:

Research approval was obtained from the research ethics committee of the

Faculty of Nursing, Zigzag University prior the study. The study's goals were explained to the participants. The patients' willingness to participate in the study was confirmed by obtaining their consent firstly. Invisibility and confidentiality of patients' data were maintained. Withdrawal from the research at any time without penalty was assured to the participants by the researchers.

Statistical Analysis:

SPSS (Statistical Package for Social Sciences) was utilized to organize, categorize, tabulate, enter, and analyze all collected data. Version 14 of the software programme was used for frequency tables and statistical significance. The arithmetic mean, standard deviation (SD), Pearson chi-square test (X2), and Pearson Correlation (r) were used to detect the relationship between the variables, the statistical significance and associations.

Results:

Table 1: clarified that, more than three quarter of the studied participants (77.8%) their ages ranged between fifty to sixty years old. Regarding to sex, the present result indicated that the majority of the patients were males and married (86.7%, 91.2%, respectively). Concerning level of education (46.7%) of the studied patients were illiterate. Also, (57.8%) of them from urban area, (68.9%) had insufficient monthly income and (53.3%) of them were free workers.

Table 2: illustrated that, 100% of the patients had cough and sputum. The majority of them had shortness of breath and fatigue (82.2%, 95.5%, respectively) followed by anorexia and weight loss (64.4%), then restlessness and insomnia (60.0%, 71.1%, respectively). Regarding the length of hospital stay for current hospital admission (60%) of the patients were from seven to fifteen days. In

relation to body mass index, (51.1%) was 23 or greater.

Table 3: indicated that (68.9%) of the studied COPD patients, were previous smokers and (73.3%) smoke one pack of cigarettes/day. Concerning duration of COPD (88.9%) were more than five years and (71.1%) had admitted to hospital 3 times or more in last year. In relation to comorbidity, (37.8%) had hypertension, (11.1%) had liver disease, (28.9%) had diabetes and (15.6%) had cardiovascular disease. Regarding to exposure to COPD risk factors, all of studied patient were exposed to smoking, second-hand smoke and dusts. Also, the majority of them exposed to chest disease and sensitivity. While more than half had bronchial asthma in childhood period and family history of COPD (55.5%, 53.3%, respectively).

Table 4: presented that there were highly statistical significant differences regarding all knowledge items of COPD throughout the study phases. Also, there were highly statistical significant difference between the (pre and post), and (pre and follow up) phases of the study concerning the total satisfactory knowledge score($P < 0.01$).

Table 5: clarified that there was highly statistically significant difference regarding all practice items of COPD throughout the study phases. Also, there were statistical significant differences between the (pre and post), and (pre and follow up) phases of the study relating the total satisfactory practice score ($P < 0.01$).

Table 6: illustrated that the greater part of the entire studied sample had severe dyspnea before application of the supportive care (48.9%). It was improved with a statistically significant between pre and post phases of the supportive care application for COPD ($p<0.05$). Also, the finding showed that there were a highly

significant improvement between the pre and follow-up phases of the supportive care application (P < 0.01)

Table 7: reported that there was a high statistical significant difference between mean scores of all items of profile of mood state and the total of mood disturbance for patients with COPD throughout the implementation of COPD supportive care (P < 0.01).

Table 8: showed that, the majority (71.1%) of studied patients had poor sleep quality before implementation of supportive care. While, in the post and follow up (51.1%, 46.7%, respectively) had good sleep with statistical significant differences between pre/post and pre/follow up phases (p<0.05). Also, there was a high statistical significant difference between mean scores of sleep quality for COPD patients through the phases of the study (P < 0.01).

Table 9: indicated that there were highly significant difference between mean score of quality of life (symptoms, activity and impact score) and total quality of life pre/post and pre/follow up with p value 0.000 %.

Table 10: presented that there was a highly significant positive correlation between patients' practice and knowledge. Also, there were highly significant positive correlations between dyspnea, mood and sleep/ QOL throughout the study phases. On the other hand, there were highly significant negative correlations between patients' knowledge and practice/dyspnea and QOL .Also, there were highly significant negative correlations between patients' knowledge and practice/ mood and sleep in the post and follow up of implementation phases.

Discussion

Chronic obstructive pulmonary disease (COPD) is a progressive obstruction of the airway with several physical and psychological issues that associated with patient's disabilities and negatively affect QOL. Nursing care has a critical role in controlling COPD symptoms, particularly dyspnea, managing the disease, reducing hospitalizations, optimizing patient's functions, teaching the skills of personal care, improving exercise ability, and maintaining the quality of care Karasu & Birimoğlu Okuyan [12]. Therefore, this study was conducted in order to evaluate the effect of supportive nursing care on symptoms severity and quality of life for COPD patients.

In terms of demographic characteristics of the patients, results of this study mentioned that more than three quarters of the studied patients were between the ages of fifty and sixty. This was in the line with Mohamed et al. [17] found that more than half of the COPD patients were above the age of 60. Also, Farag et al [23] clarified that the average age of Egyptian COPD patients was above fifty years old.

This could explain age-related effects on the respiratory system, which is one of the most important risk factors for most chronic diseases that has a negative impact on the lung, as decrease lung functions, increase gas trapping, loss of lung elasticity, and enlargement of the distal air spaces, that all of them are present in COPD Bowdish [24].

Regarding sex, the majority of the studied participants were males. This is in concordant with Farag et al [23] who told that, COPD is a disease that primarily affects men. Also, Varmaghani et al [25] reported that men have a higher global COPD prevalence than women. This could be related to the difference in tobacco smoking consumption in both sexes as well as frequent occupational

exposure to an irritating workplace. While contradicted with Africa Health Organization [26] recorded that COPD was previously more common in men, but due to indoor air pollution and women's comparatively high level of tobacco smoking, the disease now influences men and women almost equally.

Concerning level of education, nearly half of the patients were illiterate. This is in contrast with Ismael et al & Labieb et al [27- 28] who found that, in both groups, more than two-thirds of the patients were illiterate. Major causes of defect or improperly managed COPD include a lack of health awareness and knowledge about COPD.

As regard to residence; the present study reported that more than half of the patients were from urban area. This comes in consistency with Sharma and Sharma [29] who noted that a higher incidence of COPD is associated with the urban residence. While, this result disagrees with Ismael et al [27] & Mohamed, Ahmed and Mohamad [30] who found that, more than half of the patients in both study and control groups lived in rural area. This might be due to urban outdoor and indoor air pollution from cars and factories, as well as poor house sanitation and a high crowding index, which could spread infection among family members. All of these are major risk factors for COPD.

The present result demonstrated that more than half of patients had free work and one third of them had agriculture work, this may reflect the physical and psychological load of the patient related to disease medication or other family responsibilities. This finding supported by Mohammed et al [31] mentioned that the majority of the patients were working.

The socioeconomic status of a person is a significant social determinant of health. In terms of monthly income, the majority of the studied participants had insufficient monthly income. This result correspondent with Ibrahim and Abd El-Maksoud [18]; Labieb et al [28] & Mohamed, Ahmed and Mohamad [30] mentioned that, almost all patients have low family income. This finding was in agreement with Grigsby et al [32] explained that, lower socioeconomic state is an important risk factor for respiratory dysfunction with increased cases and incidence of COPD. Due to a lack of funds, the patient is unable to seek medical advice or purchase medication.

Concerning chief complain, the present result demonstrated that all of the studied patients had cough and sputum, majority of them had shortness of breath and fatigue, followed by anorexia, weight loss and restlessness for more than two thirds and nearly three quarters for insomnia. This finding corroborated with American Lung Association [33] added that, many persons don't recognize the COPD symptoms until the disease has progressed significantly. People may believe that the reasons of having shortness of breath or less able to engage in daily activities are "just getting older." Shortness of breath is a common symptom of lung disease associated with a persistent cough, frequent respiratory infections, cyanosis, fatigue, sputum, and chest wheezing.

Regarding the length of hospital stay (LOS) for the current hospitalization, two thirds of the patients stayed from seven to fifteen days. This finding was congruent with Harries et al [34] stated that, the mean length of stay varied between hospitals which ranged from 4.9 to 9.5 days. Additionally, Labieb et al [28] reported that COPD patients' LOS ranged between ten to twenty days for COPD patients.

In relation to BMI (body mass index), more than half of studied patients

were 23 or greater. This agreed with Mohsen et al [35] indicated that, COPD during its evolution can lead to muscle mass loss or obesity. Also, the median BMI for COPD patients was 26.4 kg/m^2, more than half of them were overweight and obese.

Regarding smoking status, more than two - thirds of the patients were previous smokers. This finding was supported by Wehieda, El-Sheikh and Sallam [36] who reported that about two thirds of the sample was smokers, pre teaching. Concerning duration of COPD, the majority were more than five years. This result was consonant with the finding of Mehany et al [37] clarified that majority of the subjects' duration of disease was more than 10 years of illness.

As regard to hospital admission last year, most of studied patients were admitted to hospital 3 times or more. In agreement with the current result, Bafadhel et al [38] indicated that all COPD patients have frequent hospitalizations and re-admissions, which have a significant influence on the prognosis, progress, and mortality of COPD patients, as well as severely limiting their QOL. Also, Milne, Hockey and Garrett [39] proved that COPD was the most common reason for readmissions, estimating for 39.5% and 46.8% of readmissions within thirty and ninety days, respectively.

COPD patients frequently have a number of chronic and long-term conditions. As a result, they often have an impact on health status or health-related QoL Australian Institute of Health and Welfare [40]. With regard to comorbidity of COPD, the result of this study noted that hypertension, diabetes, and cardiovascular disorders were the most common comorbidities among patients with COP. This finding was congruent with the result by labieb et al [28] & Farag et al [23] who agreed that the most

common comorbidities of COPD patients are hypertension and diabetes mellitus.

According to WHO [3] the main risk factors for COPD are smoking, long-term exposure to lung irritants (dusts, air pollution, chemical fumes, and secondhand smoke from the surrounding environment), genetics (alpha-1 antitrypsin deficiency), Age (most individuals who have COPD are at least forty years old when their symptoms begin), allergy and a history of recurring respiratory infections. In this study, all the patients exposed to smoking, environmental and occupational hazards. Also, the majority of them exposed to chest disease and sensitivity. While more than half of them had bronchial asthma in childhood period and family history of COPD. These findings were supported by Labieb [28] & Mohammed et al [31] who concluded that the most popular risk factors for COPD were occupational and environmental risks such as smoking, air pollution, indoor smoke and dust from agricultural crops. These findings may be related to the fact that the majority of the sample had low socioeconomic status, additionally poor nutrition, education, housing, and working in agriculture, all of which are major risk factors for the development of COPD.

One of the study's notable conclusions was that, there was statistically significant difference regarding all knowledge items of COPD throughout the study phases. Also, there were statistical significant differences between (pre and post) and (pre and follow -up) phases of the study regarding total satisfactory knowledge score.These findings were in harmony with Ibrahim and Abd El-Maksoud [18] & Labieb et al [28], who found that the majority of patients got poor knowledge, and all of them got inadequate knowledge concerning COPD before program implementation. Also, this study proved a statistical significant

improvement in the total knowledge score related COPD. This result was corroborated with the finding by Amer et al [41] which showed that, all of the studied patients reported a high statistical significant improvement in the level of knowledge following intervention. This reflects the positive impact of the ongoing educational sessions designed to meet the COPD patients' needs.

As regard patients' total practice of studied COPD patients, a poor practice level was found pre- implementation. This study mentioned a high statistical significant improvement in the total practice scores, post and at follow up phases of the intervention. These findings were in congruent with Mohamed et al [17]; Labieb et al [28] & Amer et al [41] who found that the continuous practice of coughing and breathing exercises influences the patients' performance positively by doing their breathing more controlled and helping them in removing sputum efficiently.

Dyspnea is a key symptom of COPD as the disease advances, its severity and magnitude worsen, and leading to considerable disability and a negative influence on QoL. The result of the present study mentioned that, nearly half of the studied sample had severe dyspnea before intervention. It was improved with statistical significant differences between both pre/post, and pre and follow-up phases of the supportive care application. This could be consequence to the disease's long duration and seriousness, as well as a lack of accurate and consistent breathing exercises. It could also be because nearly half of the study participants were smokers. That finding is corresponding with Mohamed et al [17] & Mohsen et al [35] who illustrated that, there was statistical significant difference between levels of dyspnea for patients with COPD before and after implementing COPD protocol of

care. This could be consequence to the efficient continued practice of breathing exercises that subsequently improves the respiratory muscles.

The present study showed that, there were high statistically significant differences between the total mean scores of all items of profile of mood states for COPD patients throughout the implementing of COPD supportive care. That finding is congruent with Mohamed et al **[17]** who recorded that, there was a high statistical significant difference in the mean of the total mood disturbances scores before and after implementing of the COPD protocol of care. This could be explained by the fact that the implementation of COPD supportive care had a positive influence on patients' levels of dyspnea, which in turn improved their mood.

Abnormal sleep quality is a common problem in COPD patients of various severity levels, most notably in moderate and severe cases. The most common sleep- related breathing disorder among COPD patients is obstructive sleep apnea (SOA) Ghoneim et al [42]. Concerning sleep quality, the results of this study found that majority of patients had poor sleep quality before implementation of supportive care. That result was boosted by Abd El-Fattah et al [43] & Shah et al [44] who confirmed that, poor sleep quality was linked to physical limitations, COPD exacerbations, anxiety, depression, and poor health-related QoL.While, there was a positive improvement in sleep quality in the post and at follow up. This is due to positive influence of implementing COPD supportive nursing care on patients' performance particularly, control of breathing difficulties that have positively affected their sleep pattern. To some extent, this result was comparable to Halehbandi et al [45] who indicated that the

pulmonary rehabilitation had significantly improved sleep quality.

This study revealed that, there were a high significant difference between mean score of QOL (symptoms, activity and impact scores) and total QoL pre/post and pre/follow up. This result coincided with Sabry et al [46] who found that the majority of their participants improved their QoL following the intervention as a result of the better understanding of their conditions or feeling more comfortable regarding their medications or symptoms management.

The existing study illustrated that, there was a highly significant positive correlation between patients' practice and knowledge pre, post and follow-up of the interventions. This finding was in agreement with Mohamed et al. [17] stated that a considerable relationship between knowledge and practice regarding COPD was found in experimental group versus control group at pre, post, and follow up of the interventional program. This is explained as knowledge and its application being the most important for retention. As a result, knowledge without practice is ineffective.

Also, there were high significant positive correlations between dyspnea, mood and sleep/ QOL throughout the study phases. These consistent with Labieb et al [28] stated that, applying nursing care protocol for COPD patients has improved their knowledge, practices, and respiratory outcomes; oxygen saturation, dyspnea, and hospital readmissions.

Furthermore, there were highly significant negative correlations between patients' knowledge and practice regarding to dyspnea, mood, sleep and QOL. Li et al [47] reported that, COPD patients' performance had a positive effect on their QOL, since lower scores in QOL scale indicated no impairment in patients and higher scores indicated maximum impairment.

Conclusion

COPD patients' knowledge, practice, severity of symptoms and QOL had improved as a result of supportive nursing care. This means that supportive nursing care has a significant positive effect on symptoms severity and QoL of COPD patients.

Recommendations

The following recommendations have been developed, based on the study's findings:

- Applying supportive nursing care for COPD patients.

- Awareness regarding supportive nursing care for nurses, patients and patients' family by providing the booklets.

- Supportive nursing care training programs for nurses caring for COPD patients should be maintained.

- Replication of the study with large group patients for generalization of the results

Table1. Frequency distributions of the studied patients relating to their demographic characteristics (n = 45).

Patients' characteristics	No	%
Age group		
– 30->40 years	2	4.4
– 40->50 years	8	17.8
– 50-60 years	35	77.8
Mean ± SD:	**53.00 ± 5.86**	
Sex		
– Males	39	86.7
– Females	6	13.3
Marital status		
– single	2	4.4
– married	41	91.2
– widow	2	4.4
Education Level		
– illiterate	21	46.7
– primary school	7	15.6
– secondary	11	24.4
– university	6	13.3
Residence		
– urban	26	57.8
– Rural	19	42.2
Income/month		
– insufficient	31	68.9
– sufficient	14	31.1
Occupation		
– free work	24	53.3
– not work/housewife	5	11.1
– officer	2	4.4
– Agriculture worker	14	31.2

Table2. Frequency and percentage distributions of present health history of the study patients (n = 45)

Items	No	%
Associated symptoms:		
Cough	45	100.0
Sputum	45	100.0
Shortness of breath	37	82.2
fatigue	43	95.5
Swelling of leg	17	37.8
Poor appetite	29	64.4
Restlessness	27	60.0
Weight loss	29	64.4
Insomnia	32	71.1
Length of hospital stay for current hospital admission		
≤7days	11	24.4
7-15days	27	60.0
>20 days	7	15.6
Body Mass Index		
BMI less than (19)	1	2.2
BMI (19) to less than (21)	14	31.1
BMI (21) to less than (23)	17	37.7
BMI (23) or greater	23	51.1

Table3. Frequency and percentage distributions of past health history of the study patients (n = 45).

Items	No	%
Smoking status		
− Current smoker	8	17.8
− Previous smoker	31	68.9
− Negative smoking	6	13.3
Number of cigarettes packs smoked/day		
− Non	6	13.3
− One pack	33	73.3
− Two or more	6	13.3
Duration of COPD		
− Less than five years	5	11.1
− More than five years	40	88.9
Number of hospital admission in last year		
− Once	4	8.9
− Twice	9	20.0
− 3 times or more	32	71.1

Comorbidity*		
– Hypertension	17	37.8
– Liver disease	5	11.1
– Diabetes	13	28.9
– Cardiovascular disease	7	15.6
– Renal disorder	3	6.7
exposure for COPD risk factors *		
– Smoking	45	100
– Exposure to environmental hazard	45	100
– Exposure to occupational hazard	45	100
– Bronchial asthma in the childhood period	25	55.5
– Chest diseases; such as pulmonary TB or pneumonia	37	82.2
– Sensitivity of certain foods or medications	43	86.6
– Family history of COPD	39	53.3
	24	

*More than one answer.

Table 4: Frequency and percentage distributions of patients' knowledge related to COPD throughout the study phases (n= 45).

Knowledge items	Pre		Post		FU		Pre-post		Pre-FU	
	No.	%	No.	%	No.	%	χ^2	P	χ^2	P
Disease pathophysiology	9	20.0	36	80.0	34	75.6	32.4	**0.001****	27.8	**0.001****
Risk factors	7	15.6	39	86.7	38	84.4	45.5	**0.001****	42.7	**0.001****
Symptoms	4	8.9	43	95.6	41	91.1	67.7	**0.001****	60.8	**0.001****
Causes of dyspnea	5	11.1	41	91.1	39	86.7	57.6	**0.001****	51.4	**0.001****
Sputum	9	20.0	41	91.1	35	77.8	46.0	**0.001****	30.0	**0.001****
Excerbations	5	11.1	40	88.9	33	73.3	54.4	**0.001****	35.7	**0.001****
Exercise	6	13.3	43	95.6	39	86.7	61.3	**0.001****	48.4	**0.001****
Smoking	10	22.2	42	39.3	40	88.9	46.6	**0.001****	40.5	**0.001****
Vaccination	5	11.1	39	86.7	39	86.7	51.4	**0.001****	51.4	**0.001****
Bronchodialators	4	8.9	38	84.4	37	82.2	51.6	**0.001****	48.7	**0.001****
Antibiotics	6	13.3	36	80.0	36	80.0	40.1	**0.001****	40.1	**0.001****
Oral steroid therapy	4	8.9	36	80.0	35	77.8	46.0	**0.001****	43.3	**0.001****
Inhaled steriod therapy	5	11.1	37	82.2	37	82.2	45.7	**0.001****	45.7	**0.001****
Total knowledge score										
Unsatisfactory	43	95.6	6	13.3	8	17.8	61.3	**0.001****	55.4	**0.001****
Satisfactory	2	4..4	39	86.7	37	82.2				
Mean±SD	10.55±9.17		51.95±8.65		49.80±9.26		t: 20.71 (<0.001'		t: 18.22 (<0.001*)	

(**) highly significant at P < 0.01

Table 5: Frequency and percentage distribution of patients' practice related to COPD throughout the study phases (n= 45).

Practice items	Pre No.	Pre %	Post No.	Post %	FU No.	FU %	Pre-post χ^2	Pre-post P	Pre-FU χ^2	Pre-FU P
– Breathing retraining exercise	14	31,1	41	91.1	37	82.2	34.0	0.001**	23.3	0.001**
– Airway clearance technique	12	26.6	36	80.0	32	71.1	25.7	0.001**	17.7	0.001**
– Using inhaler	11	24.4	43	95.5	40	88.9	47.4	0.001**	38.0	0.001**
– Body position to reduce dyspnea	7	15.5	40	88.9	38	84.4	48.4	0.001**	42.7	0.001**
Total practice score										
Satisfactory	11	24.4	40	88.9	38	84.4	38.0	0.001**	32.6	0.001**
Unsatisfactory	34	75.6	5	11.1	7	15.6				
Mean±SD	20.31±8.36		35.26±6.36		32.46±5.49		t: 12.50 (<0.001*)		t: 11.39 (<0.001*)	

(**) highly significant at P < 0.01

Table 6. Frequency and percentage distributions of dyspnea assessment scale among patients with COPD throughout the study phases (n= 45).

Dyspnea Grades	Pre NO	Pre %	Post NO	Post %	Follow-up NO	Follow-up %	Pre-post χ^2	Pre-post P	Pre-FU χ^2	Pre-FU P
Grade 1(G1) = 0	0	0.0	0	0.0	0	0				
Grade 2(G2) = 1	1	2.2	1	2.2	1	2.2				
Grade 3(G3) = 2	5	11.1	16	35.6	20	44.4	9.0	0.022*	14.6	0.001**
Grade 4 (G4) = 3	22	48.9	20	44.4	18	40.0				
Grade 5 (G5) = 4	17	37.8	8	17.8	6	13.3				

(*) Statistically significant at p<0.05   (**) highly significant at P < 0.01

Table 7: Mean scores of the profile of mood states for patients with COPD throughout the study phases (n= 45).

Items	Pre Mean ± SD	Post Mean ±SD	Follow-up Mean ±SD	Pre-post χ^2	Pre-post P	Pre-FU χ^2	Pre-FU P
Depression	18.17±3.93	16.26±3.85	13.95±3.60	5.54	<0.001*	9.77	<0.001*
Anger	16.26±3.68	13.24±2.46	11.40±2.37	6.50	<0.001*	9.59	<0.001*
Tension	15.53±3.46	12.88±3.31	12.22±3.246	9.18	<0.001*	9.47	<0.001*
Confusion	13.40±2.16	10.75±1.52	9.11±1.44	9.79	<0.001*	14.49	<0.001*
Fatigue	15.15±2.41	13.44±2.82	10.84±2.60	6.15	<0.001*	15.89	<0.001*
Vigor	7.93±3.12	5.37±2.52	3.11±1.04	12.95	<0.001*	11.91	<0.001*
Total mood disturbance	86.46±8.086	71.97±6.52	60.64±6.56	16.10	<0.001*	26.01	<0.001*

(**) highly significant at P < 0.01

Table 8. Frequency distribution of sleep quality of patients with COPD throughout the study phases (n= 45).

Items	Pre NO	Pre %	Post NO	Post %	Follow-up NO	Follow-up %	Pre-post χ^2	Pre-post P	Pre-FU χ^2	Pre-FU P
Poor sleep	32	71.1	21	48.9	22	53.3	5.55	0.012*	4.63	0.031 *
Good sleep	13	28.9	24	51.1	23	46.7				
Mean ±SD	9.35±4.61		5.68±3.18		6.11±3.40		t=6.48(<0.001*)		t=5.58(<0.001*)	

(*) Statistically significant at p<0.05 (**) highly significant at P < 0.01

Table 9. Difference between mean scores of quality of life for COPD patients throughout the study phases (n= 45).

Items	Pre Mean ±SD	Post Mean ±SD	Follow-up Mean ±SD	Pre-post χ^2	Pre-post P	Pre-FU χ^2	Pre-FU P
– Symptoms score	38.20±14.41	31.53±10.1	27.37±7.04	4.29	<0.001*	5.02	<0.001*
– Activity score	34.71±11.70	28.08±8.85	25.46±7.48	3.12	0.003*	5.41	<0.001*
– Impact score	41.33±17.64	31.22±10.17	28.28±8.48	3.98	<0.001*	4.82	<0.001*
Total quality of life	38.17±14.22	30.28±6.91	27.04±6.95	5.18(	<0.001*	5.26	<0.001*

(*) Statistically significant at p<0.05 (**) highly significant at P < 0.01

Table 10: Correlation coefficient between knowledge, practice, dyspnea, mood, sleep Quality and Quality of life of patients with COPD throughout the study phases (n=45).

Item		Knowledge	Practice	Dyspnea	Mood	Sleep
Pre	Know		.773[**]	-.553[**]	-.015	.076
	Practice			-.400[**]	-.222	-.130
	Dyspnea				-.406[**]	.164
	QOL	.043	-.236	-.126	.304[*]	.228
Post	Know		.606[**]	-.522[**]	-.657[**]	-.824[**]
	Practice			-.468[**]	-.513[**]	-.464[**]
	Dyspnea				.519[**]	.246
	QOL	-.612[**]	-.297[*]	.073	.398[**]	.642[**]
FU	Know		.775[**]	-.437[**]	-.641[**]	-.787[**]
	Practice			-.513[**]	-.552[**]	-.612[**]
	Dyspnea				.536[**]	.349[*]
	QOL	-.530[**]	-.338[*]	.596[**]	.413[**]	.388[**]

Correlation is (not significant NS at > 0.05 level, significant S at< 0.05, highly significant HS at <0.01)

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