



Quality of sleeping among Patients with Chronic Obstructive Pulmonary Disease

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ABSTRACT

The Chronic obstructive pulmonary disease (COPD) is a chronic disorder affecting the lung efficiency and causing respiratory disturbances as shortness of breath, cough. It highly combined with psychological distress and numerous sleeping disturbances. **Aim:** The aim was to assess the quality of sleeping among Patients with Chronic Obstructive Pulmonary Disease. **Setting sample:** Purposeful sample composed of 185 patients selected from the outpatient Clinics at Kafrelsheikh Chest Hospital. **Tool:** 1st Tool: interview questionnaire tool, This tool was 3 main parts: Part 1: personal demographic profile, Part 2: Medical data sheet, Part 3: Physical examination sheet. 2nd Tool: The Pittsburgh Sleep Quality Index (PSQI). 3rd tool: Assess factors affecting the sleep quality. 4th Tool: Depression, Anxiety and Stress Scale (DASS-21). **Results:** The results revealed that 71.4% of the study were male, 76.8% had unsatisfactory quality of sleep, 48.1% of patients' sleep was affected by daily life habits 68.6% of the patients had extremely severe level of stress. There were statistically significant associations between quality of sleep and Physiological factors, Environmental factors, Meals, Daily Life Habits. Statistically significant correlation between quality of sleep, and their anxiety, stress, and depression level was revealed. **Conclusion:** The majority of patients with COPD had an unsatisfactory level of sleep. There was a highly statistically significant difference between quality of sleep score and factors affecting sleeping, physical examination, and psychological distress. **Recommendations** Conduct educational programs for patients with COPD to improve their quality of sleeping, physiological changes, factors enhance sleeping and psychological distress related to disease.

Keywords: COPD, patients, Quality, sleeping.

Introduction

Chronic obstructive pulmonary disease (COPD) is a systemic disorder characterized by persistent airflow limitation. Chronic incompletely reversible airflow constriction and difficulty to take breaths normally characterize this form of obstructive lung disease (Tsai SC, 2017). Poor airflow is caused by emphysema, a deterioration of lung tissue, and obstructive bronchiolitis, a disease of the tiny airways. Shortness of breath and a cough that may or may not produce mucus are the most common symptoms (Singh, et al. 2019).

COPD develops over time, making ordinary tasks like walking and clothing more difficult. It is the fifth most deadly disease in the world, and the third most deadly among non-communicable diseases. COPD affects ten percent of persons aged 40 and over, taking in consideration that smoking is the greatest significant threat (Nobeschi et al, 2020) .

Chronic obstructive pulmonary disease (COPD) is considered one of the most common lung disorders and a leading cause of mortality universally. It is the world's third biggest cause of death, with 3.23 million

fatalities expected in 2019. Many of these deaths took place in low- and middle-income nations (WHO, 2020). In the United States, this affects 32 million people. COPD prevalence estimates have ranged from 7 to 19 percent over the world.

Emphysema and chronic bronchitis are the most frequent COPD diseases, and they are the two classic COPD phenotypes. Emphysema is an ailment in which the walls of the airspaces (alveoli) break down, causing permanent damage to the lung tissue (Cazzola et al., 2018). Dyspnea, exhaustion, poor sleep quality, pulmonary hypertension (PH), malnourishment, stress, anxiety, obesity, metabolic disorders as diabetes are all common co morbidities of COPD. These comorbidities are linked to a higher likelihood of hospitalization and a higher use of healthcare resources. (Nattusami et al., 2021) .

Sleep is a biological function that is vital to our well-being (Ashour et al., 2018). Commonly, Patients with COPD suffer from poor sleep quality which is attributable to recurrent desaturation, especially during rapid eye movement sleep, which aggravates disruption of the sleep. Patients with COPD also frequently experience sleep deprivation because of a productive cough and chronic dyspnea. At least 40% of COPD patients report having an unsatisfactory level of sleep, which can affect their recovery and quality of life (Shaarawy & Elhawary, 2016)

Quality of sleeping in COPD appear to be a complicated and multidimensional process resulting from multiple factors as physiological sleep alterations, gas exchange disturbances, and/or COPD (Hall A., 2015). According to myriad studies, more than 75% of COPD patients experience nighttime symptoms and sleep troubles, which appeared in prolonged sleep latency, disturbed arousals, and numerous recurrent insomnias, leading to a decrease in the patients'

daytime activity routine (Vaidya S, et al, 202). These symptoms and alterations are linked to more suffering from the disease and repeated exacerbations (Ghoneim et al.,2021).

COPD is associated with a considerable influence on patients' psychological well-being. Patients and healthcare providers rarely notice and address anxiety, stress, or depression, which are typical psychological distresses in COPD patients (Cafarella PA, et al. 2012). COPD patients had a greater frequency of psychological and mood disturbances as depression and anxiety than the overall population, with a 1.69 percent relative risk of getting depression (Atlantis E, et al, 2013). Increased feeling of dyspnea is linked to depression and anxiety symptoms. (Doyle T, et al. 2013). The occurrence of psychological distress such as depression and anxiety can increase the vital exhaustion state, which described as a condition marked by general fatigue, tiredness and deficiency of energy, growing irritability, and emotions of undermining, all of which are negatively linked to ill health (Pumar MI, et al, 2014).

The nurse plays an important and vital role in the patient therapeutic education process and integrating the patient in health care process. This educational process is a patient-centered process that includes; increasing the patients' awareness, information, learning the skills of self-care and introducing the needed psychosocial support, instructions regarding prescribed treatment, care, and regulating organizational information, as well as behavior related to health and illness in hospitals and other health care settings (Kapella MC, et al, 2016). It is intended to assist the patients and their relatives in understanding the disorder nature and its treatment options, as well as collaborating with healthcare providers (Folch et al.,2017). Although COPD is a chronic condition with

no cure, there are several things people can take to manage their symptoms. Patients may also be able to increase and improve the quality of their sleep (Kang J I., et al, 2016).

Significance of study:

Chronic obstructive pulmonary disease (COPD) is a severe health issue that distresses people all over the world. The global burden of COPD is growing, and the physical, economic, and death implications are enormous. COPD affects around 65 million people, ranging from mild to severe (Quaderi, & Hurst. (2018).

In Egypt, the prevalence of patients with COPD have inadequate quality of sleep represent 80% of the studied subjects at a university hospital in Egypt. In addition, when compared to other chronic disorders, COPD sufferers may be more expected to experience anxiety and depression. (Khalil et al., 2019).

Aim: This study aimed to assess the quality of sleeping among Patients with Chronic Obstructive Pulmonary Disease (COPD).

Research Question:

1. Is there a relation between the quality of sleep and factors affecting sleeping among patients with COPD?
2. Is there a relation between the quality of sleep and physical examination among patients with COPD?
3. Is there a correlation between quality of sleep and psychological distress (Depression, Anxiety and Stress)?

Subject and methods:

Research design: A descriptive research design was applied.

Type of sample: Purposeful sample composed of 185 patients selected from the following mentioned setting and having the following inclusion criteria; the patient diagnosed with COPD, their aged >30 years, had not an altered level of consciousness, had not psychiatric disorders and they had not Brain tumor or epilepsy.

Sample size: Based on the data from the literature (Mc Sharry et al., 2012), with a level of significance of 5% and a power of study of 80%; the sample size can be computed using the following formula: $[(Z_{1-\alpha/2})^2 \cdot SD^2] / d^2 = \text{sample size}$ Where $Z_{1-\alpha/2}$ is the standard normal variate, 1.96 at 5% type 1 error, SD is the standard deviation of the variable, and d is the absolute error or precision. As a result, the sample size is $[(1.96)^2 \cdot (17.0)^2] / (2.45)^2 = 184.96$. According to the previous formula, the sample size for the study is 185.

Settings:

The study was performed at the outpatient Clinics at Kafrelsheikh Chest Hospital affiliated to Ministry of Health and Population it serves all areas (both rural and urban areas) around Kafrelsheikh Governorate.

Pilot Study: A pilot study performed for testing the tools, to determine feasibility, relevancy, objectivity, applicability, and clarity of the study tool. To achieve that, the tools tested over 19 patients (10% of the total subjects). No modification was applied in the tools and a pilot study sample was included in the current study.

Procedure:

Once official permission was granted from the Chest hospital director. The researchers-initiated data collection through interview questionnaire which took about 30 minutes through 2 days per week (Saturday and Tuesday). The data was gathered from August 2021 to October 2021. The subjects of the pilot study

were enrolled in the study sample. During this time, the researcher got a written consent from the patients agreed to participate in the study. Then, filled out started with socio demographic characteristic and medical data, followed by physical examination sheet then Pittsburgh Sleep Quality Index and factors affecting sleep quality and Depression, Anxiety and Stress Scale (DASS-21).

Tools for data collection:

The following three tools were utilized:

1st Tool: interview questionnaire tool, which developed by the researchers to collect data divided to 3 main parts:

Part 1: personal demographic profile: such as the patients' age, gender, marital status, educational status, employment, residence, and family income.

Part 2: Medical data sheet Such as clinical data around patients' medical history, period of lung illness, associated comorbid diseases, prescribed medication, and number of admissions to hospital due to COPD.

Part 3: physical examination sheet: the researchers created it after they reviewed the literature. as [Sarkar](#) , et.,al (2019) including general information about Sputum characteristics, Barrel chest, bulging neck vein, Swelling of leg, Poor appétit, Insomnia and Cyanosis of nail and face.

2nd Tool: The Pittsburgh Sleep Quality Index (PSQI) was adopted from (Buysse et al., 1989; Curcio et al., 2013). PSQI is a self-administered questionnaire includes 19 questions that involve seven sub items including " sleep quality, sleep latency, sleep duration, habitual sleep efficiency, sleep disturbances, use of sleeping medication, and daytime dysfunction".

Scoring System: the score of each item is from 0-3. The total score is 21classified as the following; 5 or

less indicate an unsatisfactory sleep level and greater than 5 indicates to satisfactory sleep level

3rd tool: Assess factors affecting the sleep quality (Quality of sleep index).

It was Adopted from (Abou Elatta , 2015). It aimed to assess the sleep quality affecting factors in COPD patients. It formed from 5 items including: physiological changes as breath shortness, presence of sputum, chest tautness. Environmental factors as light, noise alarms, presence of health care personnel, nebulizer sessions. Meals as dense meals, hunger. Daily life habits as daytime naps, smoking. Factors promoting sleep as spiritual status, diet that promote sleep.

Scoring System: The total score is from 0 to 4. Classified as 0-2 indicates no effect on the quality of sleep and 3-4 indicates having effect on the quality of sleep.

4thTool: Assess Emotional Status through Depression, Anxiety and Stress Scale (DASS-21)

It was adopted from (Lovibond, S.H. & Lovibond, P.F. (1995) Contain 21 Items. The Depression, Anxiety and Stress Scale - 21 Items (DASS-21) is a collection of three self-report scales used to assess the emotional conditions of depression, anxiety, and stress. Each of the three DASS-21 scales has seven items, which are sub divided into subscales with equal content. The depression scale evaluates dysphonic, hopelessness, life devaluation, self-deprecation, lack of participation, anhedonia, and lethargy. The anxiety scale measures autonomic arousal, skeletal muscle effects, situational anxiety, and subjective worry affect experience. The stress scale is responsive to chronic nonspecific arousal levels. It evaluates trouble relaxing, anxious arousal, and being easily upset / agitated, irritable / overly reactive, and impatient. Summing the values for the

relevant items yields the scores for depression, anxiety, and stress.

Scoring System:

	Depression	Anxiety	Stress
Normal	0-9	0-7	0-14
Mild	10-13	8-9	15-18
Moderate	14-20	10-14	19-25
Severe	21-27	15-19	26-33
Extremely Severe	28+	20+	34+

Content Validity: Tool validity was reviewed and determined by a panel of three experts, one expert in Medical Surgical Nursing, Faculty of Nursing, Kafrelsheikh. One expert in community health nursing, faculty of nursing, Ain Shams University One expert in psychiatric nursing and mental health, faculty of nursing, Kafrelsheikh. They were asked to inspect the tools for content coverage, clarity, wording, and length.

The tools' reliability was calculated by using Cronbach's alpha test. The values were 0.879 for PSQI and 0.739 for Quality of Sleep Index.

Statistical Analysis

After end of the data gathering by the previously stated tool. Data computed and analyzed by using the Statistical Package for Social Sciences (SPSS), version 21. All data entries were checked for accurateness compared to the original raw data of each patient by the researchers. A probability level of 0.01 and 0.05 was assumed as the level of significance for all statistical tests completed.

Results:

Table 1 shows personal demographic profile of the studied sample. It revealed that 50% of the study patients were more than 60 years with a mean age of 57.5 ±9.5 years, 71.4% of the study were male. In relation to patients' educational level, 46.5% of them had a basic education. In addition, 54.6% of study

patient were married. Regarding their occupation 74.1% of study patients were working. According to their residence, 58.9% of the study patients lived in rural areas. Regarding family income, most of them had not enough income (78.9%).

Table 2 shows distribution of the studied patients regarding their medical data. It showed that 47.6% of study patient had prolonged illness 1-3 years. In relation to times of hospital admission, about 63.8% of study patient were hospitalized three or more times. Concerning the associated comorbid diseases, 45.4% of patient study suffering from diabetes mellitus. Also 55.1% of study patient suffer from productive cough. Regarding their residence, 58.9% of patients lived in rural areas. Regarding prescribed medications, 85.4% of study patients take bronchodilators

Table 3 illustrates distribution of the studied sample in relation to their physical examination. The 68.1% of study patients didn't suffer from barrel chest and 64.9% of patient hadn't bulging neck vein. And 73.5% of them hadn't swelling of leg. While 65.9% of the patients had white sputum. As regards their appetite, 83.2% had poor appetite, 56.2% of study suffering from cyanosis. Also 55.1% of study patients suffering from exacerbations.

Figure 1 presents distribution of Quality of sleep score according to PSQ. It revealed that most of the patients had unsatisfactory quality of sleep (76.8%)

Figure 2 shows distribution of Patients' assessment regarding factors affecting sleeping score.it showed that (40%) of the studied patients affected their sleeping quality by physiological factors. The results revealed that the nearly half (48.1%) of patients' sleep was affected by daily life habits. While,only one fourth (26.5%) of the patients had factors promoting sleep

Table 4 shows the distribution of the patients in relation to their psychological distress. The results revealed that nearly half of the studied patients (44.3%) had extremely severe level of depression, while (10.3%) had mild level of depression. About anxiety level, half of them (57.8%) had extremely severe level of anxiety and quarter of the patients (25.9%) had moderate level of anxiety. Regarding stress level, more than two thirds (68.6%) of the patients had extremely severe level of stress.

Table 5 shows the correlation between quality of sleep and anxiety, stress, and depression. The results revealed statistically significant correlation between quality of sleep, and their anxiety, stress, and depression level (P=0.020), (P=0.032), (P=0.012) respectively.

Table 6 presents the association between Quality of sleep score and factors affecting sleeping. The results shown that there were statistically significant association between quality of sleep and Physiological factors (related disease), Environmental factors, Meals, Daily Life Habits, Factors promoting sleep where P value (0.015), (0.036), (0.002), (0.007), (0.003) respectively.

Table 7 presents association between Quality of sleep score and Patients' physical examination. The results indicates that there were statistically significant association between quality of sleep and Barrel chest, bulging neck vein, Swelling of leg, Poor appetite, Exacerbations, Cyanosis and nails of face a at P value (<0.001), (0.009), (0.033), (<0.001), (<0.001) and (<0.001) respectively. While there is no statistically significant association between quality of sleep and Sputum characteristics P value (0.896).

Table I: Personal Demographic Profile of the Studied patients (N = 185).

	N	%
Age		
30 – 49	32	17.3
50 – 59	59	31.9
≥60	94	50.8
Mean age	57.5 ±9.5	
Sex		
Male	132	71.4
Female	53	28.6
Level of education		
Illiterate	21	11.4
Reads & writes	46	24.9
Basic	86	46.5
Bachelor	32	17.3
Marital Status		
Single	8	4.3
Married	101	54.6
Divorced	24	13.0
Widow	52	28.1
Occupation		
Working	137	74.1
Not working	48	25.9
Area of residence		
Rural	109	58.9
Urban	76	41.1
Family income		
Enough	39	21.1
Not Enough	146	78.9

Table 2: distribution of the studied patients regarding their medical data.

Items	No	%
Duration of lung illness		
Less than year	23	12.4
1-3 year's	88	47.6
More than 3 years	74	40
Times of hospital admission		
One time	48	25.9
Two times	19	10.3
Three or more	118	63.8
Associated comorbid diseases		
Diabetes Mellitus	84	45.4
Peripheral arterial disease	4	2.1
Liver Cirrhosis	63	34.1
Neurological disorder	34	18.4
Did you suffer from presence of?		
Dry cough	83	44.9
Productive cough	102	55.1
Prescribed medications		
Oral steroids	27	14.6
Bronchodilators	158	85.4

Table 3: Percentage distribution of the studied sample in relation to their physical examination

%	No	Items
Sputum characteristics		
34.1	63	Green
65.9	122	White
Barrel chest		
31.9	59	Present
68.1	126	Not present
Bulging neck vein		
35.1	65	Present
64.9	120	Not Present
Swelling of leg		
26.5	49	Present
73.5	136	Not present
Poor appetite		
83.2	154	Yes
16.8	31	No
Exacerbations		
44.9	83	Yes
55.1	102	No
Cyanosis in face and nails		
56.2	104	Yes
43.8	81	No

Table 5: correlation between quality of sleep and psychological distress (depression, anxiety, and stress)

	Anxiety		Stress		Depression	
	r.	P value	r.	P value	r.	P value
Quality of sleep	0.171	0.020	0.158	0.032	0.185	0.012

Table 6: Association between Quality of sleep score and factors affecting sleeping

factors affecting sleeping	Unsatisfactory (n=142)		Satisfactory (n=43)		Chi-Square	
	N	%	n	%	X ²	P
Physiological factors (related disease)						
Absent	92	64.8	19	44.2		
Present (n=74)	50	35.2	24	55.8	5.837	0.015
Environmental factors						
Inadequate	84	59.2	33	76.7		
Adequate (n=68)	58	40.8	10	23.3	4.393	0.036
Meals						
Good	75	52.8	34	79.1		
Not Good (n=76)	67	47.2	9	20.9	9.398	0.002
Daily Life Habits						
Healthy	66	46.5	30	69.8		
Unhealthy (n=89)	76	53.5	13	30.2	7.171	0.007
Factors promoting sleep						
Present	97	68.3	39	90.7		
Absent (n=49)	45	31.7	4	9.3	8.496	0.003

Table 7: Association between Quality of sleep score and Patients' physical examination

	Unsatisfactory (n=142)		Satisfactory (n=43)		Chi-Square	
	N	%	n	%	X ²	P
Sputum characteristics						
Green	48	33.6	15	35.7		
White	94	65.7	28	66.7	0.017	0.896
Barrel chest						
Present	45	31.5	4	9.5		
Not present	97	67.8	39	92.9	13.161	<0.001
Bulging neck vein						
Present	57	39.9	8	19.0		
Not Present	85	59.4	35	83.3	6.717	0.009
Swelling of leg						
Present	43	30.1	6	14.3		
Not present	99	69.2	37	88.1	4.519	0.033
Poor appetite						
Yes	139	97.2	15	35.7		
No	3	2.1	28	66.7	93.924	<0.001
Exacerbations						
Yes	74	51.7	9	21.4		
No	68	47.6	34	81.0	12.974	<0.001
Cyanosis of face and nail						
Yes	90	62.9	14	33.3		
No	52	36.4	29	69.0	12.739	<0.001

Discussion:

Poor quality of sleep and psychological upsets are common complaints in patients with chronic obstructive lung disease (COPD). The symptoms of chronic obstructive lung disease including wheeze,

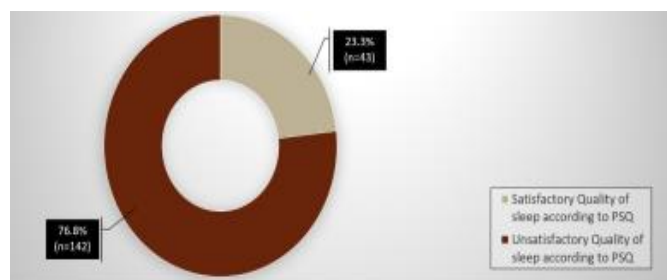


Figure 1. Distribution of Total Level Quality of sleep according to PSQ

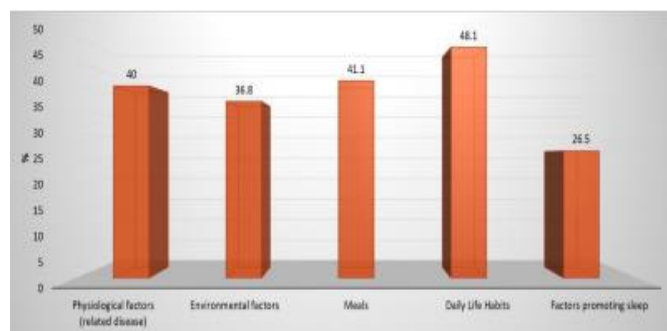


Figure 2: Distribution of Patients' assessment regarding factors affecting sleeping score

Table 4: Distribution of the study patients according to their emotional state.

Items	Mild		Moderate		Severe		Extremely severe	
	N	%	N	%	N	%	N	%
Depression	19	10.3%	27	14.6%	57	30.8%	82	44.3%
Anxiety	6	3.3%	48	25.9%	24	13%	107	57.8%
Stress	2	1.1%	21	11.4%	35	18.9%	127	68.6%

phlegm, and inhaled corticosteroid use may lead to poor quality of sleeping (**Lee Chiong T, 2017**). Hence, this study was carried out to assess quality of sleeping among patients with chronic obstructive pulmonary disease at Kafrelsheikh Chest Hospital.

Regarding the personal characteristics of the current study's patients. This outcome was familiar with **Mohamed et al. (2017)**, who conducted the study that assess "Effect of care protocol on the knowledge, practice, and clinical outcomes of patients with chronic obstructive pulmonary disease in Egypt" and observed that the age of the COPD patients in their study was above than 66 years. This result may be related to the deterioration of the pulmonary functions among healthy elderly population and even being more poorly among elderly COPD patients.

More than two-thirds of the study's subjects were men. **Salah et al. (2013)**, who conducted the study "Improving breathlessness and fatigue in patients with COPD," concluded that many of the study participants were men. This result could be related to men's higher smoking rates and more frequent professional exposure to an unpleasant work environment than women.

About half of the patients in the current study had a high school diploma. This finding is in line with **Ibrahim & El-Maksoud (2018)**, who proved that more than half of the patients had a low educational level, and the rest were illiterate, which could contribute to poor health awareness in their study "Effect of educational programs on knowledge and self-management of patients with chronic obstructive pulmonary disease."

The findings of the current study have shown that more than half of the patients were from rural areas. This finding matched that of **Badway et al. (2016)**, whose study "Prevalence of chronic obstructive

pulmonary disease (COPD) in Qena Governorate" found that the prevalence of COPD is higher among rural than urban populations. This could be attributed to patients in rural areas being exposed to rice grass burning, wood burning, and agricultural crop residues, which causes increased airway deterioration and chest discomfort. They also reside in houses with a high crowdedness index, which increases the risk of infection spreading among family members. All of them are considered important COPD risk factors. Bronchodilators are used by the majority of them.

According to the medical information of the study participants, almost half of the patients had a condition for 1-3 years, and two-thirds of them had been hospitalized three or more times. In terms of concomitant diseases, less than half of the patients had diabetes, more than half had reproductive cough, and the majority of them were on bronchodilators.

In contradiction to this study findings, the Egyptian study "Awareness of patients with chronic obstructive pulmonary disease with dyspnea and fatigue self-management guidelines" that done by **El-Gendy et al., (2015)** they found that, more than half of the patients (57%) had been diagnosed with COPD for more than one year, 59.0 percent had never been hospitalized before, and only 4.0 percent had been hospitalized three times or more. **Qureshi, et al., (2014)** "Chronic obstructive pulmonary disease exacerbations: newest evidence and clinical implications Therapeutic Advances Chronic Disease" complemented the current study. Diabetes mellitus affected half of the study participants, according to the researchers. According to the researcher, this was owing to the complications of the disease treatment regimen, as well as the fact that the bulk of the study group was over the age of 65, which is a diabetes risk factor.

In relation to the physical assessment of the studied patients, the findings described that the majority of the consumers did not have a barrel chest, bulging neck veins, or leg edema. The majority of the patients experienced cyanosis and white sputum. These findings were comparable to those of **Ibrahim & El-Maksoud (2018)**, who discovered that the majority of the study participants had coughs, sputum, and shortness of breath. In terms of their appetite, **Beek, et al., (2018)** found that the majority of them had a weak appetite. According to the researcher who investigated "Dietary resilience in patients with severe COPD at the outset of a pulmonary rehabilitation program," practically all COPD patients had poor nutritional styles due to a deficiency of financial resources and a shortage of understanding about the relevance of nutrition in COPD.

In relation to Quality of sleep score according to PSQ, the existing study exposed that the majority of the patients had an unsatisfactory level of sleep. This may be related to the nature of the disease, impairment in respiration process, which interferes with the sleep pattern. In addition, the impaired psychological status may have a key role in disturbed sleep in the studied patients. Also, most of the patients were old age which affect the sleep cycle.

These findings are in agree with **Khalil et al., 2019** who studied "*Sleep quality among patients with chronic obstructive pulmonary disease at a university hospital in Egypt*" found that the majority of patients slept in an unsatisfactory manner. COPD patients have nighttime symptoms such as dyspnea, wheeze, and cough, which have an undesirable influence on sleep quality and wellbeing status, according to the existing study.

Concerning factors affecting sleeping quality, the current study found that daily life behaviors affected

almost half of patients' sleep, whereas physiological factors affected more than a third of patients' sleep. Only one-fourth of the patients had sleep-inducing variables. **Chang CH, et al. (2016)** found that physiologic factors (inability to breathe comfortably) were the most prevalent cause of sleep disruption in patients with chronic obstructive pulmonary disease in their study "Factors responsible for poor sleep quality in patients with chronic obstructive pulmonary disease." This could be due to an impediment in the airways caused by tightening bronchioles, which restricts the movement of lungs air flow, resulting in breath difficulties (physiologic factors).

In relation to patient's psychological distress, the existent study exposed that nearly half of the studied patients had extremely severe level of depression, while the minority had mild level of depression. About anxiety level, more than half of them had extremely severe level of anxiety and quarter of the patients had moderate level of anxiety. Regarding stress level, more than two thirds of the patients had extremely severe level of stress. This can be interpreted by several factors; as age of the patient; as old ages are more sensitive to the life events, chronic suffering from the disease symptoms, multiple hospitalization, continuous need for treatment and follow up which considered a great load on the elders, most of the studied patient are married and having multiple responsibilities, and low income which act as great stressors on the patients.

These findings were on the same line with **Economou,etal., 2018** who conducted a study about Sleep, tiredness, anxiety and depression in Chronic Obstructive Pulmonary Disease and Obstructive Sleep Apnea – Overlap – Syndrome, found that the majority of copd patients expressed anxiety, stress, and depression

Regarding the correlation between quality of sleep and anxiety, stress, and depression. The results revealed statistically significant correlation between qualities of sleep, and their anxiety, stress, and depression level. This may be due to the hormonal and neurotransmitters changes during anxiety, stress, and depression; these changes are associated with changes in the sleep pattern. This result was consistent with **Swas, et al. 2017** who conducted a study about "Existence of Anxiety and Depression among Stable COPD Patients and its Influence on Functional Competency", found that there was a significant correlation between quality of life and their anxiety, stress, and depression level in patients with stable COPD.

As regards the association between Qualities of sleeps score and factors affecting sleeping. The current results shown that there were statistically significant association between quality of sleep and Physiological factors (related disease), Environmental factors, Meals, Daily Life Habits, Factors promoting sleep. This outcome is in congruence with **Chang CH, et al. 2016** who stated that physiologic factors such as frequent sputum production had a significantly worsening the score of the sleeping quality. On the opposing, **Soler X, et al. 2013** who studied the "impact of pulmonary rehabilitation on sleep quality in COPD", and stated that PSQI has a negative association with physiological factors.

Also, these findings agreed with **Alt JA, et al (2013)** who conducted research on "the assessment of sleep quality and illness severity between chronic rhino sinusitis patients", observed that tobacco smokers had significantly poorer sleep and that the PSQI and daily life behaviors had a positive statistically significant link (smoking). This outcome could be enlightened by the fact that cigarette smoking causes particle accumulation in the lower airways, which affects respiratory defenses

such as mucociliary clearance, and that modest levels of cigarette smoke can reduce lung function, affecting the patients' sleep quality.

Regarding the association between Quality of sleep score and patients' physical examination. The results indicated that there were statistically significant association between quality of sleep and Barrel chest, bulging neck vein, swelling of leg, Poor appetite, and Exacerbations. This result agreed with **halehbandi et al, 2021** who studied "*The association between sleep quality, health status and disability due to breathlessness in chronic obstructive pulmonary disease patients*" illustrated that there were association between sleep quality and health status among COPD patients. Also, this findings consistent with **Liu et al. (2014)** who studied "*Effectiveness of home-based pulmonary rehabilitation for patients with chronic obstructive pulmonary disease*", mentioned that there was a positive association between quality of sleep and exacerbations.

Conclusion:

On the light of the results and answers on research questions, the study was concluded that the majority of the studied patients with COPD had an unsatisfactory level of sleep. A highly statistically significant difference between quality of sleep score and factors affecting sleeping, physical examination and psychological distress was evident.

Recommendations:

In view of the study findings, it is recommended to

- Conduct educational programs for patients with COPD to increase their quality of sleeping, physiological changes, factors enhance sleeping and psychological distress related to disease.

- Further research is needed to determine to what extent interventions to improve sleep can produce beneficial effects on QOL in the patients with COPD.

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