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# The Quality of Life for Patients with Chronic Obstructive Pulmonary Disease

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## Abstract

**Background:** Chronic Obstructive Pulmonary Disease (COPD) is a progressive lung disease that significantly impacts a patient's quality of life. The debilitating symptoms, including shortness of breath, chronic cough, and fatigue, can severely limit daily activities and reduce overall well-being. **Aim of the study:** To assess quality of life for patient with chronic obstructive pulmonary disease **Research design**: A descriptive research design was used in this study. **Setting**: The study was conducted in chest outpatient clinic of El Sheikh Zayed Al Nahyan Hospital**. Sample:** The study comprised a convenience sample of 110 patients from total 150 patients present in outpatient clinic of El Sheikh Zayed Al Nahyan Hospital. **Tools**: Three tools used: tool (I): Personal characteristics and medical history interview questionnaire, tool (II): COPD patient quality of life, and tool (III): COPD patient compliance assessment questionnaire. **Results**: The study result revealed that, more than half of the studied patients had poor quality of life while nearly one fifth of them had good level of quality of life. In addition, three-fifths of the studied patients had inadequate compliance while two fifth of them adequate compliance. Moreover, there was a highly statistically significant positive strong correlation between quality of life and compliance among the studied patients with COPD. **Conclusion**: The study highlights that a significant portion of COPD patients experience a poor quality of life, while only one fifth achieving a good quality of life. Compliance levels were also concerning, with more than half of COPD patients showing inadequate compliance. Importantly, a strong correlation was identified between compliance and quality of life. **Recommendation:** Implement structured educational sessions focused on the importance of treatment adherence. Develop assessment tools that consider patients' occupations when creating care plans.

**Keywords:** Quality of Life, Patient, Compliance, Chronic Obstetric Pulmonary Disease

## Introduction

Chronic obstructive pulmonary disease (COPD) is a progressive lung disease characterized by persistent respiratory symptoms and airflow limitation. It encompasses conditions such as emphysema and chronic bronchitis, which are primarily caused by long-term exposure to harmful particles or gases, most notably from cigarette smoke. COPD is a leading cause of morbidity and mortality worldwide, significantly impacting the quality of life for affected individuals **(Global Initiative for Chronic Obstructive Lung Disease, GOLD, 2023).**

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In individuals with COPD, the airways become inflamed and narrowed, leading to obstructed airflow and difficulty in breathing. This obstruction is often exacerbated by the production of excess mucus and the destruction of the alveoli, the tiny air sacs in the lungs responsible for gas exchange. As the disease progresses, patients may experience increased breathlessness, chronic cough, and frequent respiratory infections, which can further complicate their health status **(Postma & Weiss, 2021).**

Risk factors for developing COPD include smoking, environmental pollutants, occupational exposures, and genetic predispositions. Smoking remains the most significant risk factor, accounting for the majority of COPD cases. Additionally, exposure to secondhand smoke, indoor air pollution from cooking and heating with biomass fuels, and occupational dust and chemicals can contribute to the development of the disease **(Tashkin & Murray, 2020).**

Quality of life (QoL) is a multifaceted concept that encompasses individuals' physical, psychological, and social well-being. It reflects how individuals perceive their position in life in the context of their culture, values, expectations, and personal goals. QoL is influenced by various factors, including health status, economic conditions, and social relationships. It is increasingly recognized as a crucial component in evaluating health outcomes and the effectiveness of medical interventions **(Wang et al., 2022).**

In the context of chronic illnesses, QoL becomes an essential focus of care. Chronic conditions like diabetes, heart disease, and COPD can significantly impair individuals' ability to perform daily activities, engage socially, and maintain emotional health. Patients with chronic diseases often experience a range of symptoms that can diminish their overall QoL, including pain, fatigue, and psychological distress **(Ekström & Bornefalk-Hermansson, 2020).**

Chronic obstructive pulmonary disease is a lung disease that severely impacts patients' QoL. The disease is characterized by persistent respiratory symptoms and airflow limitation, leading to physical limitations, social isolation, and psychological distress. Patients with COPD often experience debilitating symptoms such as breathlessness, chronic cough, and increased sputum production, which can hinder their ability to engage in everyday activities. Consequently, the physical and emotional burdens of COPD can lead to a significant decline in QoL **(GOLD, 2023).**

Compliance with treatment protocols is vital for patients with chronic COPD, as it directly influences disease progression, symptom management, and overall quality of life. Adherence to prescribed medications, including bronchodilators and corticosteroids, as well as lifestyle modifications such as smoking cessation and participation in pulmonary rehabilitation, can significantly reduce the frequency of exacerbations and hospitalizations **(Bourbeau & Saad, 2021).**

Nurses play a crucial role in the management of patients with COPD, a progressive respiratory condition that significantly impacts patients' quality of life. Nurses are responsible for conducting comprehensive assessments, developing individualized care plans, and implementing evidence-based interventions. They also provide vital education on self-management strategies, such as recognizing exacerbation symptoms and proper inhaler techniques. In addition to their clinical responsibilities, nurses provide essential emotional support to patients coping with the challenges of living with a chronic illness **(Brakema et al., 2020).**

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**Significance of the study**

Chronic Obstructive Pulmonary Disease is a major cause of morbidity and mortality worldwide, with significant geographical variation in incidence and burden. According to the Global Initiative for Chronic Obstructive Lung Disease, COPD affected around 390 million individuals globally. The Global Burden of Disease (GBD) study reports an annual incidence of 16.2 million new COPD cases, with 3.3 million deaths attributed to the disease in 2019. The prevalence of COPD remains higher in regions with low socioeconomic development and high smoking rates, such as Southeast Asia, the Western Pacific, and parts of Africa **(GOLD, 2024).**

Chronic obstructive pulmonary disease is a growing health concern in Egypt, characterized by high prevalence rates influenced by various risk factors. Recent studies indicate that the prevalence of COPD among adults in Egypt ranges from 9.6% to 17.4%, particularly among high-risk populations such as smokers and those exposed to occupational hazards **(Kassem et al., 2023).**

Men exhibit a higher prevalence compared to women, and the likelihood of COPD increases with age. Smoking stands out as the most significant risk factor, with approximately 25% of the population being smokers **(World Health Organization, 2022).**

**Aim of the Study**

This study aimed to assess quality of life for patient with chronic obstructive pulmonary disease through:

1. Determining the quality of life needs for patient with chronic obstructive pulmonary disease.
2. Assessing the compliance of patient with chronic obstructive pulmonary disease

**Research questions**

1. What is the quality of life needs for patient with chronic obstructive pulmonary disease?
2. What is the level of compliance of patients with chronic obstructive pulmonary disease?

**Subject and Methods**

The subject and methods for this study was portrayed under the four main designs as follows:

I - Technical items
II - Operational items
III - Administrative items
IV - Statistical items

**I – Technical items:**

The technical item included research design, setting, subject, and tools for data collection.

**Research design:**

A descriptive research design was utilized in this study.

**Setting:**

This study was conducted in chest outpatient clinic of El Sheikh Zayed Al Nahyan Hospital.

**Sampling:**

Convenience sample of 110 patients presented in outpatient clinic of El Sheikh Zayed Al Nahyan Hospital

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**Tools for data collection:**

The required data will be collected through the following tools:

**Tool (I): Personal characteristics and medical history interview questionnaire:**

It was included the following (age, sex, occupation, social standard, smoking habits, health condition, and disease duration)

**Tool (II): COPD patient quality of life:**

This tool classified in to two parts. **The first part** (7 items) with a total grade (35). It used a 5-point Likert scale that rating the studied patient with COPD responses as (1) Not at all, (2) Only with chest infections, (3) A few days a month, (4) Several days a week and (5) Most of day. **The second part** (31 items) with a total grade (62). It uses yes or no response. A response of yes take 2 grade and a response of no take one grade. The total tool consisted of (38 items) with a total grade (97). According to **St. George's, (2022),** subject responses were calculated in the scoring system and classified in to:

- **Good quality of life:** if the total score was less than 50%, it means less than 49 points.
- **Average quality of life:** if the total score was equal or more 60% to less than 75%, it means less than ≥ 49 < 73 point.
- **Poor quality of life:** if the total score was equal or more than 75%, it means equal or more than 73 points.

**Tool (III): COPD patient compliance assessment questionnaire:**

This tool consisted of (15 items) with a total grade (30). It uses yes or no response. A response of yes take 2 grade and a response of no take one grade. According to **(Kania et al., 2022),** subject responses were calculated in the scoring system and classified in to:

- **Adequate compliance:** if the total score was less than 75%, it means less than 23 points.
- **In-adequate compliance:** if the total score was equal or more than 75%, it means equal or more than 23 points.

**Validity**

The study tools were tested for content and face validity by jury test of five experts in the field of critical care nursing to evaluate the individual items as well as the entire instrument as being relevant and appropriate to test what they wanted to measure. The experts were asked to evaluate the individual items on the study tools in relation to its relevance and appropriateness in terms of the construct and if the items adequately measure all dimensions of the construct.

**Reliability:**

To assess reliability, the study tool was tested by the pilot subjects for calculating Cronbach's Alpha which was 0.79 for COPD patient quality of life tool, 0.85 for compliance questionnaire.

**Ethical considerations:**

An official permission to conduct the proposed study will be obtained from the Scientific Research Ethics Committee faculty of nursing, Helwan University. Participation in the study is voluntary and subjects was given complete full information about the study and their role before signing the informed consent. The ethical considerations included explaining the purpose and nature of the study, stating the possibility to withdraw at any time, confidentiality of the information where it didn`t be accessed by any other party without taking permission of the participants. Ethics, values, culture and beliefs will be respected.

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**II- Operational Items:**

**Preparatory phase:**

It was included reviewing of past, current, national, and international related literature and theoretical knowledge of various aspects of the study using books, articles, internet, periodicals and magazines to develop tools for data collection.

**Pilot study:**

A pilot study was carried out on 10% (11 patients) of the study sample to ascertain the clarity, applicability of the study tools, and to identify the obstacles and problems that may be encountered. Nurses included in the pilot study was included of the study without any modification.

**Field work:**

An approval was obtained from the study subjects individually and scientific ethical committee of faculty of nursing at Helwan University using a oral informed consent obtained from each participant prior to data collection. Assessment of COPD patients was done, oral approval obtained after the investigator introduce himself for each patient, then explain the purpose of the study to assess quality of life, and compliance. The investigator utilize two tools, each tool will need 30 -40 minutes to fill. Data collected within six months of year (2024) one day /week from 9 Am - 2pm, till the needed sample completed

**III- Administrative Items:**

Approval to carry out this study was obtained from the dean of the faculty of nursing and directors of governmental hospitals in Helwan city.

**IV-Statistical Items:**

Data entry and analysis were performed using SPSS statistical package version 32. Categorical variables were expressed as number and percentage while continuous variables were expressed as (mean ±SD). Chi-Square (x2) in one sample used to compare differences between levels quality of live as well as levels compliance among the studied patients with COPD. Crosstab Chi-Square (x2) was used to test the association between row and column variable of qualitative data. The fisher exact test was used with small, expected numbers and 2 x 2 table. Anova was used to compare means of quantitative variables at more than two groups. While Independent T test to compare means of quantitative variables at only than two groups. Pearson correlation and Scatter dot correlation were done to measure correlation between quantitative variables. For all tests, a two-tailed p-value $\leq 0.05$ was considered statistically significant, P-value $\leq 0.01$ was considered highly statistically significant. While p-value> 0.05 was considered not significant.

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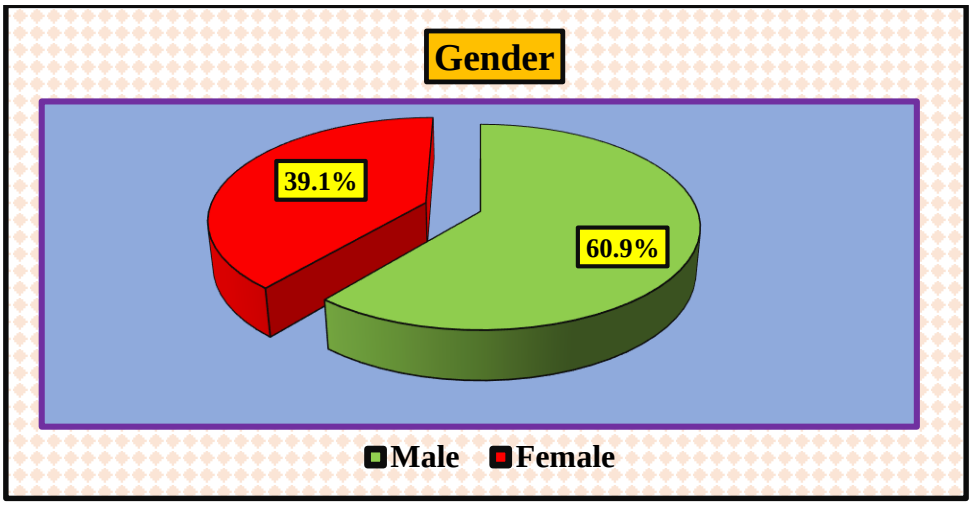
## Results:




**Male to female ratio=1.6:1**

**Figure (1):** Percentage distribution of the studied patients with COPD regarding to their gender (n= 110).

**Fig (1)** illustrates that **(60.9%)** of the studied patients with COPD were male while **(39.1%)** of them were a female with Male to female ratio=1.6:1.

**Table (1):** Frequency distribution of the studied patients with COPD according to their personal characteristics (n=110)

| Items | | No. | % |
|---|---|---|---|
| Age (year) | ▪ 40< 50 years | 41 | 37.3 |
| | ▪ 51< 60 years | 54 | 49.1 |
| | ▪ 61 < 70 years | 15 | 13.6 |
| | **Mean ± SD** | **53.4±5.8** | |
| Occupation | ▪ Housewife | 24 | 21.8 |
| | ▪ Private | 26 | 23.6 |
| | ▪ Governmental | 42 | 38.2 |
| | ▪ Farmer | 0 | 0.0 |
| | ▪ free business | 18 | 16.4 |
| Monthly income | ▪ Sufficient | 26 | 23.6 |
| | ▪ Insufficient | 84 | 76.4 |
| Smoking habit | ▪ Nonsmoker | 36 | 32.7 |
| | ▪ Current smoker | 61 | 55.5 |
| | ▪ stopped smoking | 13 | 11.8 |
| If smoker (n=61), number of smoking pack \ day | ▪ One pack | 54 | 88.5 |
| | ▪ More than 1 pack | 7 | 11.5 |

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**Table (1):** shows personal characteristics among the studied patients with COPD. It illustrates that **(49.1%)** of the age of the studied patients with COPD between 51 ≤ 60 years old with a mean age of **53.4±5.82**. Additionally, more than one-third **(38.2%)** were working at governmental occupation. Moreover, more than three-quarters **(76.4%)** of them had insufficient monthly income. As well, more than half **(55.5%)** of the studied patients with COPD were smokers. Out of this percentage **(88.5%)** of the studied patients with COPD smoked one pack of cigarettes.

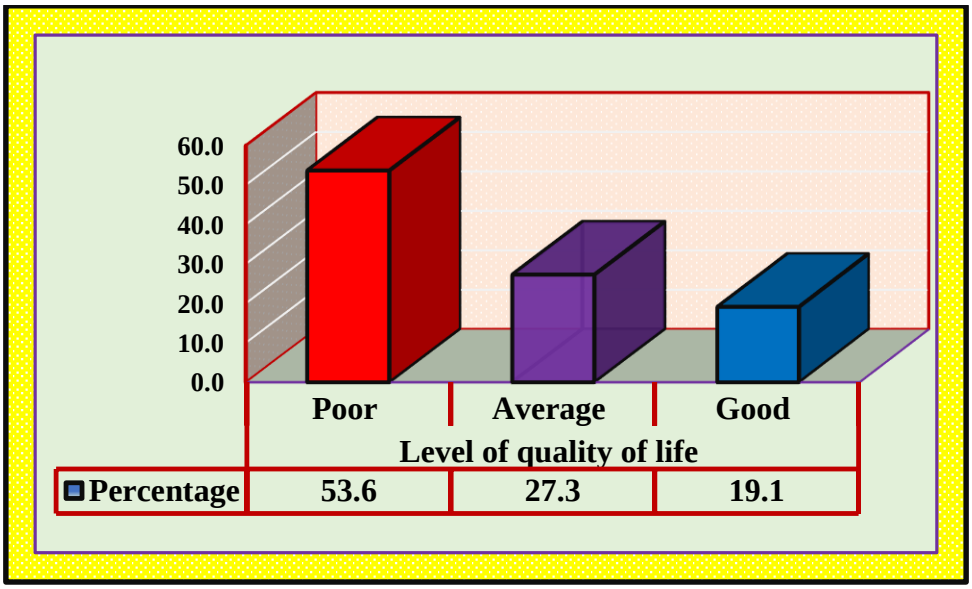
**Table (2):** Total mean score of quality of life among the studied patients with COPD (n= 110)

| Quality of Life | No | % | Min | Max | $\bar{x}$ ± SD | F test | P value |
|---|---|---|---|---|---|---|---|
| ▪ Poor | 59 | 53.6 | 73 | 97 | 86.00±8.7 | | |
| ▪ Average | 30 | 27.3 | 49 | 71 | 56.13±7.5 | | |
| ▪ Good | 21 | 19.1 | 38 | 48 | 44.86±3.1 | | |
| **Total** | **110** | **100.0** | **38** | **97** | **70.0±19.2** | **291** | **0.000**** |

***Significant p ≤ 0.05** ****Highly significant p ≤ 0.01**

**N.B: High score indicates poor quality of life**

**Table (2)** represents that the total mean score of quality of life among the studied patients with COPD was $\bar{x}$ ± SD= **70.0±19.2 (out of 97)** with a highly statistically significant difference at P = 0.000.




$\chi^{2}$=21.5, P= 0.001**

**Figure (2):** Percentage distribution of level of quality of life among the studied patients with COPD (n= 110)

**Fig (2)** shows that **more** than half **(53.6%)** %of the studied patients had poor quality of life while the minority **(19.1%)** of them had good level of QOL.

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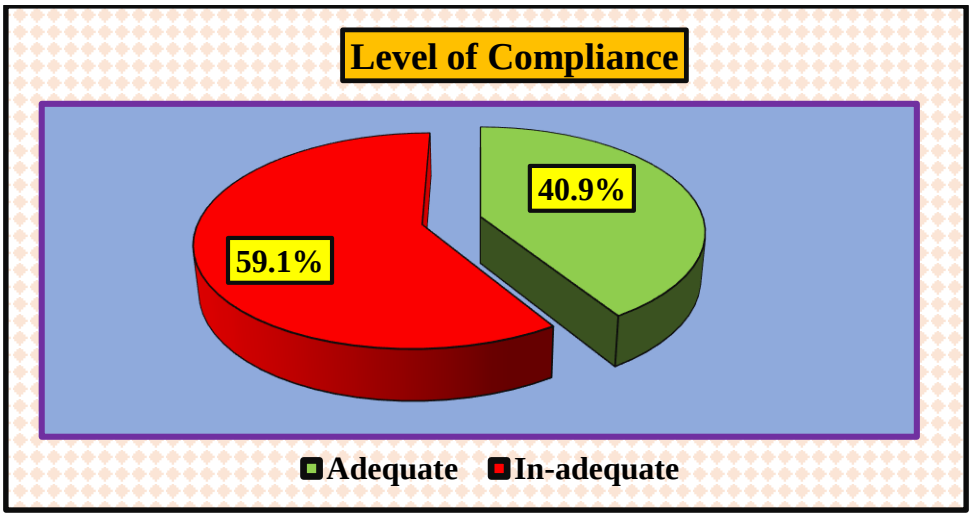
**Table (3):** Total mean score of compliance among the studied patients with COPD (n= 110)

| Compliance | No | % | Min | Max | $\bar{x}$ ± SD | T test | P value |
|---|---|---|---|---|---|---|---|
| ▪ In-adequate | 45 | 40.9 | 15 | 20 | 16.42±1.9 | | |
| ▪ Adequate | 65 | 59.1 | 23 | 30 | 26.31±2.7 | | |
| **Total** | **110** | **100.0** | **15** | **30** | **22.26±5.4** | **20.8** | **0.000**** |

*Significant p < 0.05 **Highly significant p < 0.01

N.B: High score indicates inadequate compliance.

**Table (3)** represents that the total mean score of compliance among the studied patients with COPD was $\bar{x}$ ± SD= **22.26±5.4 (out of 30)** with a highly statistically significant difference at P = 0.000.




$\chi^{2=3.6, P= 0.05*}$

**Figure (3):** Percentage distribution of level of compliance among the studied patients with COPD (n= 110)

**Fig (3)** shows that about three-fifths **(59.1%)** %of the studied patients had inadequate compliance while (**40.9%**) of them adequate compliance.

**Table (4):** Correlation between of quality of life and compliance among the studied patients with COPD (n= 110)

| Variables | Quality of life | | Compliance | |
|---|---|---|---|---|
| | r | P | r | P |
| ▪ Quality of life | 1 | | 0.983 | 0.000** |
| ▪ Compliance | 0.983 | 0.000** | 1 | |

*Significant p < 0.05 **Highly significant p < 0.01

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**Table (4):** describes there was a highly statistically significant positive strong correlation between quality of life and compliance among the studied patients with COPD at r = 0.983 & P = 0.000.

## Discussion

Globally, COPD is one of the leading causes of morbidity and mortality, with its impact being particularly profound in developing countries. COPD is a progressive respiratory condition that significantly affects patients' physical functioning, quality of life, and ability to maintain employment and social connections **(Karasu & Birimoğlu Okuyan, 2021).** Studies indicate that early diagnosis and appropriate management strategies are essential for improving health outcomes and minimizing hospital admissions **(GOLD, 2022).** Nurses play a crucial role in the management of patients with COPD. Nurses are responsible for conducting comprehensive assessments, developing individualized care plans, and implementing evidence-based interventions **(Bourbeau & Saad, 2021).**

**In term of personal characteristics of the studied patients with COPD,** as regard to gender, the results of the current study indicated that, nearly two thirds of the studied patients with COPD were males, while more than one third of them were a female. This may due to increase number of smoking in male than females in Egypt. This aligns with the findings of **Eisner et al., (2022),** entitled "Gender differences in COPD prevalence and exposure to respiratory irritants", who observed that men are more likely to develop COPD due to higher smoking rates and occupational exposures to respiratory irritants.

The present study findings showed that nearly half of the studied patients with COPD between 51 ≤ 60 years old. This may be due to the cumulative exposure to risk factors, including environmental pollutants and age-related declines in lung function, which predispose older adults to COPD. These findings are consistent with those of **Khedr et al., (2021),** entitled "Prevalence and risk factors of chronic obstructive pulmonary disease among rural Egyptians", in Egypt, who found that; the condition predominantly affected individuals over 50 years old.

Regarding occupation, more than one-third were working at governmental occupation, while others were private, house-wife or free business. This may reflect the physical and psychological burdens imposed by the disease, medications, and family responsibilities. No patients were identified as farmers, reflecting the urban context of the study. These occupational patterns align with those reported by **Ahmed and El-Sayed (2019)** study conducted in Egypt entitled "Occupational impacts on COPD severity and symptomatology", who highlighted that individuals working in sedentary government jobs may experience milder symptoms compared to those in physically demanding jobs, such as construction workers or factory laborers.

Socioeconomic status is a significant determinant of health, the finding of the current study revealed that, more than three-quarters of them had insufficient monthly income, reflecting the economic challenges faced by many COPD patients in Egypt. Financial constraints limit patients' access to medical care and essential medications, compounding the challenges of managing the disease. This result was accordance with a study conducted by **Almagro et al., (2019),** entitled "Income disparities and health outcomes in COPD patients" in Spain, who reported that; low-income COPD patients are more likely to experience poorer health outcomes due to delayed treatment and inadequate adherence to medication regimens.

Regarding smoking status, the current study results showed that, more than half of the studied patients with COPD were current smokers, with only a small fraction being non-

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smokers or former smokers. This may due to cultural and social factors that normalize smoking, particularly among men, contributing to the high prevalence of COPD. These findings are consistent with **Eisner et al., (2022)** study entitled "Smoking cessation and psychological barriers among COPD patients", and who highlighted that smoking remains the most significant risk factor for COPD worldwide.

The quality of life (QOL) among patients with Chronic Obstructive Pulmonary Disease (COPD) is often reported to be low, with significant percentages of individuals experiencing poor health-related quality of life. **Regarding level of quality of life among the studied patients with COPD,** the present study represents that the total mean score of quality of life among the studied patients with COPD was mean± SD= **70.0±19.2 (out of 97)** with a highly statistically significant difference at P = 0.000. Also, it illustrated that, more than half of the studied patients had poor quality of life while the minority of them had good level of QOL. The findings suggest that insufficient social and medical support in Egypt may contribute to the low QOL scores among COPD patients, emphasizing the need for broader community and healthcare support systems. This result agrees with a study of **Vestbo and Hurd (2019).** "Impact of chronic obstructive pulmonary disease on quality of life", found that the combination of physical impairment, emotional distress, and social isolation makes QOL worse for COPD patients over time, reinforcing the need for comprehensive care strategies.

**Concerning level of compliance regarding medication among patients with COPD.** The study found that the total mean score of compliance among the studied patients with COPD was mean + SD= 22.26±5.4 (out of 30) with a highly statistically significant difference at P = 0.000. Additionally, it illustrated that, nearly three-fifths of patient's demonstrated inadequate compliance across all areas, with only two-fifths achieving adequate levels of compliance. The low adherence observed in this study may stem from limited patient follow-up and lack of accessible education programs on the importance of consistent medication use. These findings align with the results of **Wang et al. (2022)** study "Healthcare access and COPD non-adherence in low-income countries", who reported that non-adherence is more prevalent in low-income countries due to limited healthcare access, low awareness, and competing life priorities.

However, the findings differ from **Jones et al. (2020)** study "Compliance in COPD patients within multidisciplinary care models", who found better overall compliance in countries with comprehensive follow-up services and multidisciplinary care models. This suggests that the absence of regular follow-ups and structured support systems in Egypt contributes to the lower compliance levels observed in this study.

**Concerning the correlation between of quality of life and compliance among the studied patients with COPD,** this study identified that, there was a highly statistically significant positive strong correlation between quality of life and compliance among the studied patients with COPD at (r = 0.983) & (P = 0.000). Patients with better compliance demonstrated higher QOL, which aligns with global research suggesting that adherence to medication, nutrition, and lifestyle recommendations is essential for managing COPD and improving life satisfaction. However, the study also reflects unique challenges within the Egyptian healthcare context, where socio-economic barriers and inconsistent healthcare access affect both compliance and QOL. The findings indicate that patients with higher compliance reported better QOL, with nearly one-fifth of compliant patients achieving good QOL, compared to a smaller portion of non-compliant patients. These results are consistent with research by **Wang et al. (2022)** "Effects of adherence on quality of life in COPD patients",

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who found that adherence to treatment improves symptom management, reduces exacerbations, and enhances daily functioning, all contributing to higher QOL.

Similarly, **Ekström et al. (2020)** study "Compliance in COPD: Impact on healthcare utilization and physical health", highlighted that compliant patients report fewer hospital visits, better mental health, and improved physical endurance. These findings underscore the importance of integrated care programs that promote adherence through education, follow-ups, and lifestyle counseling. However, the lack of rehabilitation programs and patient support systems continues to challenge efforts to sustain compliance over time. The socioeconomic barriers in Egypt make it challenging for patients to maintain adherence, which in turn impacts QOL.

Patients with inadequate compliance reported significantly worse QOL, with nearly one-third falling into the poor QOL category. This aligns with findings from **Miravitlles et al. (2019)** study "Consequences of non-compliance in COPD patients", who observed that non-compliant COPD patients experienced more frequent exacerbations, hospitalizations, and reduced physical function, leading to deteriorated QOL. **Tashkin and Murray (2020)** study "Non-adherence in COPD: Impact on disease progression and QOL", similarly found that no adherence, particularly in smoking patients, worsens disease progression, resulting in severe breathlessness and emotional distress. The relationship between poor compliance and QOL in this study reflects the cumulative effect of neglected treatment over time. Patients who stop medications prematurely, fail to follow nutritional advice, or continue smoking tend to experience worsening symptoms and higher levels of psychological distress, further reducing their QOL. These findings emphasize the need for comprehensive patient education to address the barriers to compliance and mitigate its impact on QOL. In Egypt, educating patients on the importance of consistent adherence is crucial to improving their health and quality of life outcomes.

The relationship between compliance and QOL observed in this study mirrors trends reported in both high-income and low-income countries, although the specific challenges differ. In higher-income countries, such as the United States and Canada, **Bourbeau and Saad (2021)** study "Improving QOL in COPD patients through structured follow-ups", found that compliance improves significantly with structured follow-ups and patient education programs. These interventions help patients manage their symptoms more effectively, resulting in improved QOL outcomes. In contrast, **Brakema et al. (2020)** study "Challenges in maintaining compliance in low-resource settings for COPD patients", reported that compliance remains a challenge in low-resource settings, where limited healthcare access, medication shortages, and economic constraints hinder adherence. The findings of this study align with these global observations, as Egyptian patients face similar barriers that affect both compliance and QOL. The systemic healthcare barriers in Egypt, including limited resources and high treatment costs, likely contribute to the significant relationship observed between compliance and QOL.

## Conclusion

The study highlights that a significant portion of COPD patients experience a poor quality of life, while only one fifth achieving a good quality of life. Compliance levels were also concerning, with more than half of COPD patients showing inadequate compliance. Notably, occupation emerged as a significant factor influencing the quality of life, while age significantly impacted compliance. Importantly, a strong correlation was identified between compliance and quality of life, suggesting that improving compliance may enhance overall patient quality of life.

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## Recommendations

**Based on the findings of the present study, the following suggestions were recommended:**

**For Nurses:**

- Implement structured educational sessions focused on the importance of treatment adherence.
- Develop assessment tools that consider patients' occupations when creating care plans.
- Use standardized compliance assessment tools during routine check-ups to gauge adherence levels.

**For Future Research:**

- Future research should explore a more diverse population to understand how different demographic factors impact quality of life and compliance.
- Perform longitudinal studies tracking patients over extended periods to understand how compliance fluctuates with changes in lifestyle, economic status, or disease progression.

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