

## Health-Related Quality of Life in a Sample of Chronic Obstructive Pulmonary Disease Patients in AL-Diwanyia Province /Iraq.

Akram H. Kareem<sup>\*1</sup> and Dheyaa J. Kadhim<sup>\*\*</sup>

\* Ministry of Health and Environment , , Afak General hospital.

\*\*Department of Clinical Pharmacy, College of Pharmacy, University of Baghdad, Baghdad, Iraq.

### Abstract

The extent to which patient's usual or expected physical, emotional and social well-being are affected by a medical condition or its treatment is known as health-related quality of life. Chronic obstructive pulmonary disease (COPD) is a common respiratory disease. Assessment of health-related quality of life is considered important in such chronic diseases. The aim of the current study was to measure health-related quality of life in a sample of chronic obstructive pulmonary disease patients in AL- Diwanyia city/Iraq. This study was carried out on 150 already diagnosed chronic obstructive pulmonary disease patients who attended to the Center of Respiratory Diseases/AL-Diwaniyah Teaching Hospital during September 2019 to January 2020. The Arabic version of St George's Respiratory Questionnaire was used to assess the health-related quality of life. The mean symptoms score was  $48.65 \pm 7.17$ , the mean activity score was  $62.39 \pm 5.81$ , the mean impact score was  $42.83 \pm 7.90$  and the total score  $49.58 \pm 4.82$ . Symptom score was predicted by disease duration (negatively) and hospital admission (positively), activity score and impact score could not be predicted by any of independent variables and total score was predicted by forced expiratory volume in the first second (negatively) and hospital admission (positively). In conclusion, health-related quality of life decline in COPD patients. Increased number of hospital admissions and decreased lung function were associated with a significant worsening in health-related quality of life.

**Keywords:** Health-related quality of life, COPD, St George's respiratory questionnaire, AL-Diwanyia, Iraq.

### جودة الحياة الصحية لدى عينة من مرضى الانسداد الرئوي المزمن في مدينة الديوانية/ العراق

اكرم حسين كريم<sup>\*1</sup> و ضياء جبار كاظم<sup>\*</sup>

\* وزارة الصحة والبنية ، مستشفى افاق العام .

\*\* فرع الصيدلة السريرية ، كلية الصيدلة ، جامعة بغداد ، بغداد ، العراق .

### الخلاصة

تعرف جودة الحياة الصحية بأنها مدى تأثر الحالة البدنية والعاطفية والاجتماعية المعتادة او المتوقعة للمريض بالحالة المرضية او علاجها . يعد مرض الانسداد الرئوي المزمن أحد أكثر أمراض الجهاز التنفسي شيوعاً. إن تقييم جودة الحياة الصحية يعتبر مهم لمثل هكذا امراض مزمنة. هدفت الدراسة الحالية إلى قياس جودة الحياة الصحية لدى عينة من مرضى الانسداد الرئوي المزمن في مدينة الديوانية / العراق. أجريت الدراسة المستعرضة الحالية على 150 مريضاً من المشخصين مسبقاً بمرض الانسداد الرئوي المزمن ممن حضروا إلى مركز أمراض الجهاز التنفسي / مستشفى الديوانية التعليمي خلال الفترة من تشرين الاول 2019 إلى كانون الثاني 2020. تم تقييم جودة الحياة الصحية باستخدام النسخة العربية من استبيان سانت جورج التنفسي . كان متوسط درجة الأعراض  $48,65 \pm 7,17$  ، وكان متوسط درجة النشاط  $62,39 \pm 5,81$  ، وكان متوسط درجة التأثير  $42,83 \pm 7,90$  ، والناتجة الإجمالية  $49,58 \pm 4,82$  . يتم توقع درجة الأعراض من خلال مدة المرض (سلباً) ودخول المستشفى (إيجابياً) ، ولا يمكن توقع درجة النشاط ودرجة التأثير من خلال أي من المتغيرات المستقلة ويمكن توقع النتيجة الإجمالية من خلال حجم الزفير القسري في الثانية الأولى (سلباً) ودخول المستشفى ( بشكل ايجابي). كنتيجة ، فإن جودة الحياة الصحية كانت منخفضة لدى مرضى الانسداد الرئوي المزمن . ارتبط ازدياد عدد مرات دخول المستشفى وانخفاض وظائف الرئة بتدهور كبير في جودة الحياة الصحية. الكلمات المفتاحية: جودة الحياة الصحية ، الانسداد الرئوي المزمن ، استطلاع سانت جورج التنفسي ، مدينة الديوانية ، العراق.

### Introduction

Chronic obstructive pulmonary disease (COPD) is a disease characterized by chronic respiratory symptoms with poorly reversible restriction of airflow that is typically progressive. COPD is currently considered a major incurable worldwide health problem, and is the world's fourth largest cause of death<sup>(1)</sup>. COPD prevalence was (5.6 %) in 2015 and is expected to increase to (7.8%) by 2030<sup>(2)</sup>. COPD affects about 600 million patients worldwide and is a growing concern in the elderly with rising numbers of COPD patients aged 65 or older<sup>(3)</sup>. Health-related quality of life (HRQOL)

was adapted from the more general and wide-ranging concept quality of life (QOL). The HRQOL is defined as: "The extent to which patient's usual or expected physical, emotional and social well-being are affected by a medical condition or its treatment"<sup>(4)</sup>. COPD progressively impairs patients' ability to carry out activities of daily living and reduces breathing capacity<sup>(5)</sup>, so the patients will undergo a progressive decline in their lung function due to the disease's symptoms (shortness of breath, wheezing, cough, etc.), which will subsequently reduce their HRQOL<sup>(6)</sup>.

<sup>1</sup>Corresponding author E-mail: akram\_hassan17@yahoo.com

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Some factors such as dyspnea, poor mobility, depression, and inadequate social support adversely affect HRQOL, and these factors may be amenable to treatment more than treating the impairment in lung function only<sup>(5)</sup>. Health status measurement is becoming an important issue for the day-to-day management of COPD patients in both primary and secondary health care<sup>(7)</sup>. Studying HRQOL for patients with COPD will provide the health care professionals with specific information concerning the problems that these patients develop. Accordingly, these will enable them to implement interventions directed toward improving patients' care<sup>(5)</sup>. Studies report that a shorter survival is related to worse health status/HRQOL<sup>(8-10)</sup>. Both general and disease-specific instruments have been used to measure HRQOL in patients with COPD<sup>(11,12)</sup>. However, using disease-specific questionnaires may be more representative of the disease state than general questionnaires that do not focus on any specific disease<sup>(13)</sup>. The St. George's Respiratory Questionnaire (SGRQ) is a well-known disease-specific questionnaire for measuring HRQOL in asthma and COPD<sup>(14)</sup>. The current study aimed to measure HRQOL in patients with COPD in the province of AL-Diwanyia /Iraq.

#### **Patients and method**

##### **Administrative arrangement and ethical considerations**

According to the requirements of the division of graduate studies in the College of Pharmacy, University of Baghdad, a research proposal that explains the purpose of the study and methods for data collection was submitted to the university committee and approval was obtained. Then approval was obtained from the Ministry of Health. Whereas consent to participate in the study was obtained verbally.

##### **Patients**

The current cross-sectional study involved 150 already diagnosed COPD patients who attended to the Center of Respiratory Diseases/AL-Diwaniyah Teaching Hospital during September 2019 to January 2020.

##### **Inclusion criteria**

- 1-Already diagnosed COPD patients of either sex who give consent to participate in the study.
- 2-Age of the patients between 18 and 70 years of age.
- 3-In stable phase (clinically stable condition with no physical finding or symptoms suggestive of exacerbation for at least two weeks).
- 4-Disease duration (since diagnosis) of at least six months or more.
- 5-Do not have co-morbid diseases such as unstable coronary heart disease, heart failure, hypertension, diabetes mellitus, kidney or liver failure.

##### **Exclusion criteria**

- 1-Patient with cognitive, speech, or a hearing deficit that would affect questions understanding.
- 2-Patient who take antidepressant drugs, or being on treatment for any neurological or psychological diseases.
- 3-Patients providing incomplete information during completion of the questionnaire also excluded from the study.
- 4-Pregnant or lactating mothers.

##### **Study tools**

A questionnaire was used to collect data required for the current study which include:

- 1-Demographic characteristics: Age, gender, body mass index, social status, educational level, residency, etc.
- 2-Disease-related variables: duration of disease, number of medication, duration of medication use.
- 3-Measurement of HRQOL using Arabic version of SGRQ<sup>(15)</sup>. The SGRQ contains 50 items in 3 key components: "symptoms (8 items), activity (16 items), and impact of disease (26 items)." The total score ranges from 0 to 100, where higher scores indicating poorer HRQOL<sup>(16)</sup>. The symptoms part is related to the effects, severity and frequency of respiratory symptoms; the activity part is related to daily activities that are impaired by or cause breathlessness; while the impact part is related to the psychological disturbances and social functioning associated with the respiratory disease<sup>(17)</sup>.

In addition, pulmonary function tests were measured by spirometer to measure forced expiratory volume in the first second (FEV1), forced vital capacity (FVC), FEV1 to FVC ratio, and the forced expiratory flow at 50% of FVC (FEF50%). While severity of COPD was classified according to the Global Initiative for Chronic Obstructive Lung Disease (GOLD) staging system as follow<sup>(18)</sup>:

- A-GOLD 1: Mild where  $FEV1 \geq 80\%$  predicted.
- B-GOLD 2: Moderate where  $50\% \leq FEV1 < 80\%$  predicted.
- C-GOLD 3: Severe where  $30\% \leq FEV1 < 50\%$  predicted.
- D-GOLD 4: Very severe where  $FEV1 \leq 30\%$  predicted.

##### **Administration of the questionnaires**

When the patients visited the Center of Respiratory Diseases/AL-Diwaniyah Teaching Hospital for checkup and to receive their medications, they were interviewed by the researcher and asked if they were willing to participate. If they agreed, a clarification of the questionnaire was given and each patient was allowed to fill the research questionnaire which takes about 5-10 minutes to be filled completely.

##### **Statistical analysis**

Data of the current study was analyzed using the Social Sciences Statistical Package (SPSS version 23) and the Microsoft Office Excel 2010 edition. Categorical variables were represented as

(number and percentage). Initially, quantitative variables were checked for normality by Kolmogorov-Smirnov test. Then quantitative variables were presented as (mean  $\pm$  standard deviation) or as median (interquartile range). Multivariate regression analysis to find the predictors of quality of life score in COPD patients enrolled in this study. *P*-value was considered to be significant when it is  $\leq$  than 0.05 and highly significant when it is  $\leq$  than 0.01.

## Results

From the total of 150 patients involved in the current study, the number of male patients was 115 (76.67%) whereas the number of female patients was 35 (23.23%). The mean age of patients was (58.17  $\pm$  7.60 years). Other sociodemographic characteristics of patients are shown in Table 1. While the disease characteristics of patients are shown in Table 2. The disease characteristics of patients are shown in Table 2

**Table 1. Sociodemographic characteristics of COPD patients enrolled in the current study**

Characteristic	Result	Characteristic	Result
<b>Age (years)</b>		<b>Smoking</b>	
Mean $\pm$ SD	58.17 $\pm$ 7.62	Yes, <i>n</i> (%)	91 (60.7 %)
<b>Gender</b>		No, <i>n</i> (%)	59 (39.3 %)
Male, <i>n</i> (%)	115 (76.7 %)	<b>Alcohol</b>	
Female, <i>n</i> (%)	35 (23.3 %)	Yes, <i>n</i> (%)	0 (0.0 %)
<b>BMI (kg/m<sup>2</sup>)</b>		No, <i>n</i> (%)	150 (100.0 %)
Mean $\pm$ SD	25.71 $\pm$ 4.90	<b>Have children</b>	
<b>Social status</b>		Yes, <i>n</i> (%)	142 (94.7 %)
Single, <i>n</i> (%)	6 (4.0 %)	No, <i>n</i> (%)	8 (5.3 %)
Married, <i>n</i> (%)	144 (96.0 %)	<b>Profession</b>	
<b>Education level</b>		Employee, <i>n</i> (%)	35 (23.3 %)
Illiterate, <i>n</i> (%)	35 (23.3 %)	Student, <i>n</i> (%)	6 (4.0 %)
Primary, <i>n</i> (%)	74 (49.3 %)	Retired, <i>n</i> (%)	29 (19.3 %)
Secondary, <i>n</i> (%)	29 (19.3 %)	Self-employed, <i>n</i> (%)	39 (26.0 %)
University, <i>n</i> (%)	12 (8.0 %)	No job, <i>n</i> (%)	18 (12.0 %)
<b>Residency</b>		Housewife, <i>n</i> (%)	23 (15.3 %)
Urban, <i>n</i> (%)	82 (54.7 %)		
Rural, <i>n</i> (%)	68 (45.3 %)		

*n*: number of cases; **SD**: standard deviation; **BMI**: body mass index

**Table 2. Disease characteristics of COPD patients enrolled in the current study**

Characteristic	Result	Characteristic	Result
<b>Disease duration (years)</b>		<b>FEV1/FVC</b>	
Mean $\pm$ SD	4.09 $\pm$ 2.51	Mean $\pm$ SD	97.80 $\pm$ 9.85
Range (min.-max.)	1 -13	Range (min.-max.)	73.00 -129.91
<b>Emergency admission</b>		<b>FEF50</b>	
Median (IQR)	1 (1.0)	Mean $\pm$ SD	45.61 $\pm$ 16.65
Range (min.-max.)	0 -6	Range (min.-max.)	19.23 -153.77
<b>Hospital admission</b>		<b>Gold stage</b>	
Median (IQR)	1 (0.25)	Mild intermittent, <i>n</i> (%)	0 (0.0 %)
Range (min.-max.)	0 -3	Mild persistent, <i>n</i> (%)	0 (0.0 %)
<b>FEV1</b>		Moderate persistent, <i>n</i> (%)	0 (0.0 %)
Mean $\pm$ SD	64.80 $\pm$ 7.60	Gold 2, <i>n</i> (%)	139 (92.7 %)
Range (min.-max.)	41.28 -79.47	Gold 3, <i>n</i> (%)	11 (7.3 %)
<b>FVC</b>		<b>Treatment</b>	
Mean $\pm$ SD	67.61 $\pm$ 11.01	Protocol 1	26 (17.3 %)
Range (min.-max.)	31.55 -97.26	Protocol 2	118 (78.7 %)
		Protocol 3	6 (4.0 %)

“*n*: number of cases; **HS**: Highly significant; **NS**: not significant; **SD**: standard deviation; **IQR**: inter-quartile range; **FEV1**: Forced expiratory volume in the first second; **FVC**: Forced vital capacity; **PEF**: Peak expiratory flow; **FEF50%**: Forced expiratory flow; *n*: number of cases; **SD**: standard deviation; **protocol 1**: as required short acting  $\beta_2$  agonist; **protocol 2**: Long acting bronchodilator + inhaled steroid + (as required short acting  $\beta_2$  agonist); **protocol 3**: Long acting bronchodilator + inhaled steroid + oral theophylline + oral steroid +(as required short acting  $\beta_2$  agonist) ”.

Results of HRQOL parameters of COPD patients enrolled in the current study are shown in Table 3.

**Table 3. Assessment of health-related quality of life of COPD patients enrolled in this study.**

Characteristic	Results
Symptom score (mean $\pm$ SD)	48.65 $\pm$ 7.17
Activity score (mean $\pm$ SD)	62.39 $\pm$ 5.81
Impact score (mean $\pm$ SD)	42.83 $\pm$ 7.90
Total score (mean $\pm$ SD)	49.58 $\pm$ 4.82

The mean symptoms score was 48.65  $\pm$ 7.17, the mean activity score was 62.39  $\pm$ 5.81, the mean

impact score was 42.83  $\pm$ 7.90 and the total score 49.58  $\pm$ 4.82.

Multivariate regression analysis to find the predictors of HRQOL is shown in table 4. Symptom score is predicted by disease duration (negatively) and hospital admission (positively), activity score and impact score cannot be predicted by any of independent variables and total score is predicted by FEV1(negatively) and hospital admission (positively).

**Table 4. Multivariate regression analysis to find the predictors of quality of life score in COPD patients enrolled in this study**

Characteristic	Symptoms scores		Activity scores		Impact scores		Total scores	
	r	P	r	P	r	P	r	P
Gender	0.032	0.726	-0.025	0.801	-0.030	0.761	0.017	0.851
Age	-0.049	0.631	-0.132	0.234	-0.178	0.102	-0.199	0.055
Disease duration	-0.217	<b>0.025*</b>	0.038	0.714	0.170	0.096	0.136	0.159
Social status	0.069	0.455	-0.14	0.161	0.070	0.477	0.036	0.694
Education Level	0.152	0.090	-0.118	0.220	0.168	0.076	0.069	0.439
Residency	0.124	0.148	-0.015	0.872	0.118	0.197	0.109	0.208
Smoking	-0.014	0.882	0.049	0.637	-0.088	0.385	-0.113	0.243
Alcohol intake	---	---	---	---	---	---	---	---
Have child	0.133	0.146	0.069	0.484	0.057	0.562	0.131	0.158
Emergency admission	-0.005	0.960	-0.066	0.532	-0.048	0.645	-0.053	0.585
Hospital admission	0.264	<b>0.028*</b>	0.062	0.522	0.042	0.663	0.120	<b>0.035*</b>
Profession	0.190	0.089	-0.084	0.391	0.119	0.220	0.163	0.076
BMI	-0.029	0.731	0.074	0.410	-0.005	0.954	-0.009	0.917
FEV1	-0.045	0.803	0.156	0.424	-0.150	0.433	-0.198	<b>0.027*</b>
FVC	0.316	0.136	0.116	0.613	0.155	0.489	0.309	0.148
FEV1/FVC	-0.002	0.989	0.202	0.182	0.049	0.738	0.140	0.318
FEF50	-0.167	0.156	-0.034	0.791	0.034	0.788	-0.033	0.781
Gold stage	0.159	0.150	0.145	0.225	-0.046	0.694	0.022	0.844
Treatment protocol	-0.061	0.469	0.031	0.730	-0.130	0.144	-0.253	0.003
Adjusted R <sup>2</sup>	<b>0.218</b>		<b>0.107</b>		<b>0.131</b>		<b>0.236</b>	

“BMI: body mass index; FEV1: Forced expiratory volume first second; FVC: Forced vital capacity; FEF50%: Forced expiratory flow; \*: Significant at  $P \leq 0.05$ ; \*\*: Highly significant at  $P \leq 0.01$ ”.

## Discussion

The COPD's burden is increasing worldwide <sup>(19)</sup>, and it is one of the most common causes of death in most countries <sup>(20)</sup>. The mean age of COPD patients participating in the current study was (58.17  $\pm$ 7.62 years). COPD is more likely to increase with age and an old age represents a risk factor for COPD <sup>(21)</sup>.

In the present study, (76.7 %) of the patients were males. COPD is considered a male dominant disease. The higher prevalence rate in male gender may be due to higher smoking rate among men <sup>(22)</sup>. In addition, occupational exposures are more frequent among men <sup>(23)</sup>. In the current study, (60.7

%) of patients were smokers confirming the fact that smoking is a risk factor for COPD across the world <sup>(24)</sup>.

The HRQOL of COPD patients is affected by many factors. However, the extent of effect of each factor is difficult to be predicted since many different questionnaires are used <sup>(7)</sup>. Many general questionnaires have been used to measure HRQOL in both asthma and COPD, however, using disease-specific questionnaires may be more representative of the disease state than general questionnaires that do not focus on any specific disease <sup>(13)</sup>.

The total SGRQ score in current study ( $49.58 \pm 4.82$ ) was lower (indicating better HRQOL) compared to scores of 59, 63 in Spanish, and Tunisian COPD patients, respectively<sup>(25, 26)</sup>. The differences in COPD patients' characteristics may explain the observed difference as well as the severity of disease since the current study involved only patients in stable phase (stable condition for at least two weeks).

The mean impact score ( $42.83 \pm 7.90$ ) reported in the current study was lower than mean symptom score ( $48.65 \pm 7.17$ ) and activity score ( $62.39 \pm 5.81$ ) (Table 3). Since the impact domain reflects different aspects of disturbances in psychological and social functioning, a lower score indicates a better psychosocial functioning as well as better overall HRQOL<sup>(13)</sup>.

Among all aspects affecting COPD, the activity score was the highest, indicating that dyspnea is the most distressing COPD symptom affecting HRQOL. The same results were reported in the previous studies<sup>(27-29)</sup>.

Multivariate regression analysis showed that symptom score was predicted by disease duration (negatively) suggesting a better control of symptoms for those who have longer disease duration. This result is inconsistent with that reported in other studies that showed COPD patients with the more impairment in their HRQOL are those having longer duration disease duration<sup>(30, 31)</sup>. This inconsistency may be related to the mean disease duration of patients involved in the current study ( $4.09 \pm 2.51$  years) was relatively short, indicating that patients are still in the early stages of the disease and have not reached its advanced and final stages, which reduce the quality of life.

In addition, symptom and total scores were predicted by hospital admission (positively). Obviously, more patient hospitalizations usually indicate more disease severity. Hence, it can be predicted that patients with repeated hospital admission had worse HRQOL. The current study confirms the adverse effect of hospital admission on HRQOL in COPD patients. This is consistent with findings of earlier studies in different countries<sup>(32-34)</sup>.

Lung functions as measured by FEV1 showed that the lower the FEV1 of COPD patients, the lower the patient's HRQOL. This association of FEV1 and HRQOL supports the findings from previous studies<sup>(35, 36)</sup> and was expected. With impaired lung function, the normal activity will be limited or curtailed. However; Spencer *et al.*, study reported a weak association between HRQOL assessed by SGRQ and lung function as measured by FEV1<sup>(37)</sup>. The current study showed HRQOL of COPD patients involved in the current study could not be predicted by that age, gender, BMI, education level, and smoking. Similar findings were reported in previous studies regarding age<sup>(38, 39)</sup>, gender<sup>(40, 41)</sup>,

and BMI<sup>(38, 42)</sup>. However, other studies reported that lower level of education was associated with a worse HRQOL<sup>(31, 43)</sup>. In addition, contrary to the findings of the current study, Ferrer *et al.*, study showed that both impact and symptoms scores were significantly more impaired in smokers than non-smokers<sup>(16)</sup>.

The present study has some limitations. Since this study is a cross sectional study which involved a one-time measurement of exposure and outcome, it is difficult to derive a causal relationship compared to studies that involved pre-and post-exposure assessments. Furthermore, the study included only one governorate in Iraq, so results cannot be generalized.

## Conclusion

The HRQOL is impaired in COPD patients. Increasing the number of hospital admission and decreased lung function was associated with a significant worsening in HRQOL.

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