

Health-related quality of life of chronic obstructive pulmonary disease patients: A hospital-based study

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ABSTRACT

Background: Chronic obstructive pulmonary disease (COPD) is a chronic respiratory disease characterized by the presence of persistent respiratory symptoms and airflow limitation due to airway and/or alveolar abnormalities owing to significant exposure to noxious particles or gases. Restricted activities of daily living as a result of reduced pulmonary function or dyspnea, impair quality of life in such patients. **Methods:** A cross-sectional study was conducted in a tertiary care hospital of Lucknow with 250 COPD patients to assess their health-related quality of life (HRQOL) using the St. Georges Respiratory Questionnaire (SGRQ). Study participants were selected using a systematic random sampling method. **Results:** HRQOL of participants was significantly impaired. Employment status and airflow limitation severity of study participants had a statistically significant negative correlation whereas, duration since diagnosis of disease was seen to have a statistically significant positive correlation with SGRQ scores. **Conclusion:** COPD deteriorated the quality of life of patients. The activity score was the most affected. Urban residents had a comparatively poor HRQOL.

Keywords: Chronic obstructive pulmonary disease, health-related quality of life, St. Georges Respiratory Questionnaire

Introduction

Chronic obstructive pulmonary disease (COPD) is used to describe chronic lung diseases that cause limitations in lung airflow which includes “chronic bronchitis” and “emphysema.” The Global Burden of Disease Study reported 251 million cases of COPD in 2016 and an estimated 3.17 million deaths in 2015.^[1] The condition is underdiagnosed and life-threatening.^[2] More than 3 million people died of COPD in 2005 corresponding to 5% of all deaths globally.^[3] In 2002, COPD was the fifth leading cause of death globally and in the next 10 years, total deaths are

projected to increase by more than 30% that will bring it to the third position of leading cause of death worldwide in 2030.^[3] Low and middle-income countries are known to shoulder much of the burden of COPD with almost 90% of COPD deaths taking place in these countries.^[3]

In India, noncommunicable diseases (NCDs) were estimated to have accounted for 53% of all deaths and 44% of disability-adjusted life-years (DALYs) lost in 2005. Of these, chronic respiratory disease (CRD) accounted for 7% deaths and 3% DALYs lost.^[4] India roughly has a burden of 30 million COPD patients.^[5]

Symptoms commonly encountered by COPD patients are breathlessness, excessive sputum production, and a chronic cough. However, COPD is not simply a “smoker’s cough,”

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but an underdiagnosed, life-threatening lung disease that may progressively lead to death.^[3] The easily identifiable risk factor so far is cigarette smoking.^[6] Others include occupational exposures to dust and chemicals, indoor and outdoor air pollution, genetic factors (e.g., alpha-1-antitrypsin deficiency), increasing age, lower socioeconomic status, and history of severe childhood respiratory infection.^[6]

Previously, the disease affected men commonly, but with increased tobacco use among women in high-income countries and increased exposure to indoor air pollution in low-income countries, COPD now affects both genders almost equally.^[7]

Quality of life of COPD patients can be severely impaired and deteriorates with increasing severity of disease as there is an accelerated decline in lung function and progressive impairment of the physical performance of the patient.^[8] The disease restricts people from socializing and enjoying their hobbies, which makes many feel frustrated and angry. Patients fight for air while doing simple tasks and struggle to stay physically active and risk early death.^[2]

Objectives

The objectives of the study were to assess the quality of life of COPD patients and its distribution and relationship with various factors.

Methods

Study area

The study was conducted in Lucknow, Uttar Pradesh.

Study period

The study was conducted from September 2018 to August 2019.

Study unit

Individual COPD patient.

Study setting

Respiratory Medicine OPD of King George's Medical University, Lucknow, Uttar Pradesh.

Inclusion criteria

Subjects above 18 years, diagnosed with COPD for ≥ 3 months and residents of Lucknow for ≥ 6 months were included in the study.

Exclusion criteria

Those with severe mental illness and/or vocal disability or mental retardation, acute exacerbation, organ failure, and those currently on treatment for pulmonary tuberculosis were excluded from the study.

Sampling technique

A systematic random sampling method was used to select the patients for the study and a target to enroll five patients per day was

set. Every fourth COPD diagnosed patient attending Respiratory Medicine OPD for follow-up was included in the study and, if the selected subject did not fulfill the inclusion criteria then the next COPD diagnosed subject was considered. Patients were approached considering the inclusion criteria of the study after they finished a consultation with the physician. Patients were explained about the purpose and objectives of the study clearly before starting the interview. Written informed consent was taken from the patients. At the end of the interview queries of the patients were addressed.

Sample size estimation

The sample size was calculated using following formula $n = (Z_{1-\alpha/2})^2 (SD)^2 / d^2$ keeping confidence interval 95%, standard deviation 19.3, and margin of error 2.5, the minimum sample size according to the above formula is 229, for this study a sample size of 250 was calculated.^[9]

Pretesting

The designed schedule was pretested on 10% of the total sample. Relevant modifications were made in the schedule to overcome the difficulties faced during pretesting.

Ethical consideration

The ethical clearance was obtained from the Institutional Ethics Committee of King George's Medical University UP, Lucknow before commencing the study (Ref Code: 93rd ECM II B-Thesis/P40).

Data analysis

Data were tabulated and analyzed by using the Statistical Package for Social Sciences (SPSS) version 24.0.

Results

The mean age of the study subjects was 59.55 ± 10.1 years. Out of the total 250 subjects, a majority (69.6%) were males, married (92.8%), Hindus (86.0%), and 70.8% belonged to a joint family. A majority (82.4%) of subjects were unemployed at the time of the interview and 60% belonged to the upper socioeconomic class backgrounds. More than half (58.4%) had a history of smoking. The mean duration of the disease since diagnosis was 2.32 ± 0.96 years. Almost half (53.6%) of the subjects had moderate airflow limitation [Table 1].

Descriptive statistics of HRQOL [Table 2], shows the mean total SGRQ score of 45.66 (SD ± 13.9) of urban subjects and 37.39 (SD ± 13.3) of rural subjects. Among all the components of SGRQ, the activity score was the most affected (55.82 [SD ± 19.5]), whereas, impacts score was the least affected (31.04 [SD ± 15.5]). The activity score showed maximum variability with a range from zero (best possible status of health) to a hundred (worst possible status of health).

In the associations between HRQOL and clinical profile of study subjects [Table 3], it is seen that the mean SGRQ scores were

Table 1: Sociodemographic Characteristics and Clinical Profile of Study Subjects

Characteristics	Urban (n=84)		Rural (n=166)		Total (n=250)	
	No.	Percentage	No.	Percentage	No.	Percentage
Age (Mean±SD)	61.38±11.6		58.63±9.2		59.55±10.1	
Gender						
Male	60	71.4	114	68.7	174	69.6
Female	24	28.6	52	31.3	76	30.4
Current Marital Status						
Married	76	90.5	156	94.0	232	92.8
Unmarried	8	49.5	10	6.0	18	7.2
Religion						
Hindu	73	86.9	142	85.5	215	86.0
Muslim	11	13.1	24	14.5	35	14.0
Category						
Reserved	46	54.8	106	63.9	152	60.8
Unreserved	38	45.2	60	36.1	98	39.2
Type of Family						
Joint	57	67.9	120	72.3	177	70.8
Nuclear	27	32.1	46	27.7	73	29.2
Education						
Up to Primary	41	48.8	87	52.3	128	51.2
Middle School and above	43	51.2	79	47.7	122	48.8
Current Employment Status						
Unemployed	67	77.9	149	89.8	206	82.4
Employed	17	22.1	17	10.2	44	17.6
Socioeconomic Status						
Upper Class	53	63.1	97	58.4	150	60.0
Others	31	36.9	69	41.6	100	40.0
Smoking Status						
Former smokers	47	56.0	68	41.0	115	46.0
Never smoker	17	20.2	87	52.4	104	41.6
Current smoker	20	23.8	11	6.6	31	12.4
Duration since diagnosis (Mean±SD)	2.35±1.04		2.31±0.91		2.32±0.96	
Airflow Limitation Severity* #						
Mild (≥80)	2	2.4	10	6.0	12	4.8
Moderate (≥50-<80)	40	47.6	94	56.6	134	53.6
Severe (≥30-<50)	33	39.3	58	34.9	91	36.4
Very Severe (<30)	9	10.7	4	2.4	13	5.2

*FEV₁ (Post Bronchodilator % Predicted), #GOLD Grading**Table 2: Descriptive Statistics of Health-Related Quality of Life of Study Subjects**

Components of SGRQ*	Urban (n=84)	Rural (n=166)	Total (n=250)	Minimum	Maximum
		Mean±SD			
Symptoms Score	44.24±16.0	39.05±12.6	40.79±14.0	13.07	91.28
Activity Score	63.66±21.1	51.86±17.5	55.82±19.5	0.0	100.00
Impacts Score	35.83±15.1	28.62±15.2	31.04±15.5	1.63	95.80
Total Score	45.66±13.9	37.39±13.3	40.17±14.1	8.15	92.00

*SGRQ- St. George's Respiratory Questionnaire

higher in smokers. HRQOL of COPD patients deteriorated with increased duration and severity of the disease. A statistically significant association was observed across all components of SGRQ and clinical profile of study subjects.

Table 4 shows the correlation of different variables with components of SGRQ. Employment status and airflow limitation severity of study subjects were found to have a significant negative correlation whereas duration since diagnosis was found

to have a significant positive correlation with all components of SGRQ.

Discussion

The present study showed an impaired HRQOL across all components of SGRQ; where the activity component was the most affected while the impacts component was the least affected. This study highlights that Indian COPD patients

Table 3: Relation between Health-Related Quality of Life and Clinical Profile of Study Subjects

Variables	Symptom Score		Activity Score		Impacts Score		Total Score	
	Mean±SD	P	Mean±SD	P	Mean±SD	P	Mean±SD	P
Status of Smoking								
Never smoker	38.05±13.1	0.009	48.63±17.3	<0.001	25.21±15.5	<0.001	34.44±13.6	<0.001
Current and Former smokers	42.75±14.4		60.95±19.5		35.20±14.1		44.26±13.0	
Duration since diagnosis (years)								
≤1	35.93±13.1	<0.001	48.63±18.4	<0.001	24.97±13.7	0.001	33.96±12.6	<0.001
>1-5	38.90±12.9		52.66±17.1		29.78±14.5		38.23±12.7	
>5-10	42.17±13.8		60.81±20.8		36.09±17.9		44.59±15.9	
>10	50.62±14.1		67.19±19.8		37.44±13.8		47.58±12.1	
Airflow Limitation Severity *#								
Mild	34.72 ±13.8	<0.001	31.91±12.7	<0.001	10.66±5.1	<0.001	21.10±5.5	<0.001
Moderate	37.55±12.1		54.96±18.1		29.62±13.7		38.62±12.5	
Severe	43.98±14.3		55.08±16.6		31.67±13.4		40.81±11.3	
Very Severe	57.52±14.8		92.00±10.4		60.10±13.6		69.34±8.9	

*FEV₁ (Post-bronchodilator % predicted), #GOLD Grading**Table 4: Correlation of Components of SGRQ# with Different Variables**

Variables	Symptoms Score	Activity Score	Impacts Score	Total Score
Marital status	-0.290**	0.084	0.011	-0.011
Education	-0.113	-0.117	-0.203**	-0.181**
Employment status	-0.179**	-0.235**	-0.348**	-0.336**
Airflow limitation severity	-0.345**	-0.380**	-0.441**	-0.475**
Duration since diagnosis	0.331**	0.292**	0.248**	0.321**

#SGRQ- St. George's Respiratory Questionnaire **Correlation is significant at the 0.01 level (2-tailed)

*Correlation is significant at the 0.05 level (2-tailed)

suffer somewhat similar reductions in HRQOL as do COPD patients from other countries, as reported previously.^[10-12] The mean age of patients was consistent with the findings by Assal, *et al.*^[13] Distribution of study subjects based on area of residence and gender were similar to the findings by Castelino, *et al.*^[14] Ahmed, *et al.*^[15] and Bhardwaj, *et al.*^[16] respectively. The results in the present study for the duration since diagnosis of disease were as per previous studies.^[14,15] Results of studies by Ahmed, *et al.*^[15] Bhardwaj, *et al.*^[16] and Assal, *et al.*^[13] for airflow limitation severity were similar to findings in the present study. The status of smoking of subjects is consistent with the findings reported by other authors.^[17,18]

Conclusion

HRQOL is impaired in COPD patients. The majority of the study subjects belonged to upper socio-economic status (SES), which is a confirmation that the COPD epidemic is not limited to a lower socioeconomic class. A few of study subjects had mild airflow limitation, indicating that patients tend to ignore the illness until they experience major symptoms, also a few of subjects in the study had a very severe limitation in airflow, indicating that majority of them might be admitted in the hospital or could not survive the disease. The study revealed that the disease is not restricted to smokers only but was seen in non-smokers too indicating first-hand tobacco smoke is not the only cause of COPD but several other factors also contribute

majorly. As, the chronic respiratory disease is a major contributor to all NCD deaths that are largely preventable through effective interventions, this calls for an urgent need to strengthen primary healthcare approaches against NCDs for early diagnosis and prompt treatment.

Ethical approval

The study was approved by the Institutional Ethics Committee.

Declaration of patient consent

The authors certify that they have obtained all appropriate patient consent forms. In the form, the patient (s) has/have given his/her/their consent for his/her/their images and other clinical information to be reported in the journal. The patients understand that their names and initials will not be published and due efforts will be made to conceal their identity, but anonymity cannot be guaranteed.

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Conflicts of interest

There are no conflicts of interest.

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