

## Original Article

## Health Related Quality of Life (HRQOL) assessment using St. George's Respiratory Questionnaire in patients with stable Chronic Obstructive Pulmonary Disease

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### Abstract

**Introduction:** Despite being a major cause of chronic morbidity and mortality throughout the world and its relentlessly increasing incidence, Chronic Obstructive Pulmonary Disease (COPD) is an often neglected major public health problem in developing countries like Nepal. Though the health expenditure for management of COPD is gradually increasing, little attention has been given to the Quality of Life (QOL), which should be the main target for management of any chronic diseases. This study assesses the Health Related Quality of Life (HRQOL) of stable COPD patients.

**Methods:** A descriptive observational cross-sectional study of 81 stable COPD patients (who were on regular medication for at least 3 months) was conducted in Respiratory out Patient department of Tribhuvan University Teaching Hospital (TUTH). All the subjects were assessed for their HRQOL using the St. George's Respiratory Questionnaire for COPD (SGRQ-C). Socio-demographic data regarding the patients were also recorded. Data entry and statistical analysis were performed using the SPSS software, version 18.0.

**Results:** The mean age of COPD patients was 67 years. Out of the total 81 study cases, 46(56.8%) were female and 67(82.7%) were either current or past smokers. Patients with COPD showed significantly reduced health related quality of life (HRQOL) in all domains. Smoking status and baseline hypoxia showed a highly significant association with HRQOL. Age, education status, occupation and gender did not affect the QOL scores in a statistically significant manner. Adding methylxanthine to the standard combination inhaler therapy did not show any significant different in term of HRQOL.

**Conclusion:** This study showed that Nepalese COPD patients had reduced HRQOL. Smoking and baseline hypoxia had significant negative impact on HRQOL.

**Keywords:** Chronic obstructive pulmonary disease, Nepalese patients, Quality of life, St. George's respiratory questionnaire for COPD patients

### Introduction

Chronic Obstructive Pulmonary Disease (COPD), the fourth leading cause of death in the world<sup>1</sup>, represents an important public health challenge that is both preventable and treatable. It is a major cause of chronic morbidity and mortality throughout the world; many people suffer from this disease for years, and die prematurely from it or its complications. Globally, the

COPD burden is projected to increase in coming decades because of continued exposure to its risk factors and aging of the population<sup>2</sup>. COPD is an often neglected major public health problem in Nepal where 33% of men and 15% of women are smokers, and 85% of all households and 98% of rural households still rely on daily use of biomass fuels for cooking<sup>3,4</sup>. It is estimated that COPD accounts for 43% of the non-communicable disease burden and 3% of hospitalizations in Nepal<sup>5</sup>.

As COPD is a noncurable and progressive disease, it reduces breathing capacity and impairs patients' ability to carry out activities of daily living, thereby adversely affecting health related quality of life (HRQOL)<sup>6</sup>. Quality of life (QOL) is an important aspect for measuring the impact of chronic diseases. HRQOL measurement facilitates the evaluation of efficacy of medical interventions and also the detection of groups at risk of psychological or behavioral problems<sup>7</sup>. Many studies have been conducted across the world to study the HRQOL of COPD patients and the factors affecting it using generic and disease specific questionnaires<sup>6,8,9</sup>. So far there is no single hospital based study in our country which shows the QOL of our COPD patients. We do not know whether the QOL of our COPD patient who is on regular medicine is very worse or it is comparable to QOL of COPD patients from other countries.

Taking these points into consideration, we decided to assess the HRQOL of stable COPD patients, who is on regular medicines. SGRQ-C is well validated tool for assessment of HRQOL of COPD patient. It assesses all three domains of QOL like symptoms, activity and impact of the disease on patient's life.

## Methods

This study was a tertiary care hospital (TUTH) based descriptive observational cross-sectional study in which 81 subjects (aged  $\geq 40$  years) were studied. The study was conducted from Nov 2016 to April 2017. Eligible subjects were diagnosed stable COPD patient who was on regular medications (for at least 3 months) and visited respiratory OPD for regular follow up. A patient who was suffering from other chronic comorbidities like cardiac problems or other chronic respiratory diseases has been excluded. Those who have been suffered from acute exacerbation within 3 months has also been excluded.

All the subjects were assessed for their HRQOL using the SGRQ-C questionnaire. SGRQ is a standardized, self administered questionnaire for measuring impaired health and perceived HRQOL in airways disease. The SGRQ-C is a shorter version derived from the original version [St. George's respiratory questionnaire (SGRQ)] following a detailed analysis of data from large studies in COPD<sup>10</sup>. It contains 40 items with 76 weighted responses that cover three domains: Symptoms, activity, and impact<sup>11</sup>. In addition to the domain scores, a total score is calculated. Each item has an empirically derived weight. The SGRQ-C is scaled from 0 to 100; with

0 representing the best HRQOL. This instrument has been demonstrated to be valid, reliable, and responsive among patients with COPD.

Socio demographic information was also collected from every patient, which included age, sex, education, occupation, and area of residence.

Data entry and statistical analysis were performed using the Statistical Package for the Social Sciences (SPSS) software, version 18.0. The mean and standard deviation of HRQOL scores were calculated. For assessing the relationship between categorical variables and HRQOL scores, independent t test and one way anova was used. P value of  $< 0.05$  was considered statistically significant. Research proposal was approved by Institutional Review Board, Institute of Medicine on 14 sep, 2016.

## Results

**Table 1: Demographic and clinical profile of study population**

Characteristics	value
Age in years (mean $\pm$ SD)	66.7 $\pm$ 9.5
Sex	
Male	35 (43.2%)
Female	46 (56.8%)
Occupation	
Housemaker	46 (56.8%)
Retired	14 (17.3%)
Farmer	21 (25.9%)
Education status	
Literate	33 (40.7%)
Illiterate	48 (59.3%)
Smoking status	
Non-smoker	14 (17.3%)
Current smoker	15 (18.5%)
Past smoker	52 (64.2%)
SpO2	
Hypoxia (SpO2 $\leq$ 88%)	38 (46.9%)
SpO2 $>$ 88%	43 (53.1%)
Medications	
Inhaled Bronchodilator + ICS	54(66.7%)
Inhaled Bronchodilator, ICS + methylxanthine	27(33.3%)

The mean age of COPD patients was 67 years. Out of the total 81 study cases, 35(43.2%) were males, 48(59.3%)

were illiterate and all 46(56.8%) females were homemakers. Among them, 67(82.7%) were either current or past smokers [Table 1]. The number of patient with hypoxia (SPO<sub>2</sub> <88%) in room air was 38(46.9%).

The number of patients who was on combination inhaer therapy was 54(66.7%) and those taking methylxanthine as add on therapy was 27(33.3%).

The mean symptom, activity, impact, and total score observed were 56.1, 62.5, 43.9, and 52.0, respectively. The scores showed significant impairment in all three domain measures when compared with reference values. (Table 2)

**Table 2: Quality of life scores of study patients**

	Symptom score	Activity score	Impact score	Total score
Mean	56.1	62.5	43.9	52.0
Standard deviation	26.9	20.9	21.6	20.7

Smoking status was found to have a statistically significant association with QOL scores except the activity domain. Similarly, patients who were hypoxic at room air had significantly higher score in all three domain measures. Age, education status, occupation, medications used( adding methylxanthine to combination inhaler therapy) and gender did not affect the QOL scores in a statistically significant manner. (Table 3)

**Table 3: Association of HRQOL with categorical variables**

Variables		Symptom score		Activity score		Impact score		Total score	
		Mean	P value	Mean	P value	Mean	P value	Mean	P value
Age group(yrs)	40 – 60	45.4	0.081	73.2	0.181	32.0	0.465	47.0	0.3
	61 – 70	50.8		57.6		43.0		48.9	
	> 70	65.9		66.3		47.3		57.0	
Sex	Male	58.1	0.582	63.6	0.697	43.6	0.92	52.8	0.773
	Female	54.7		61.7		44.1		51.4	
Occupation	Housemaker	54.8	0.605	61.8	0.422	44.1	0.669	51.4	0.607
	Retired	62.9		69.1		47.7		56.9	
	Farmer	54.9		59.9		40.9		49.9	
Education Status	Literate	52.4	0.299	59.5	0.289	39.9	0.166	48.6	0.226
	Illiterate	58.7		64.6		46.7		54.3	
Smoking status	Non-smoker	37.3	<0.001*	51.6	0.087	31.5	0.003*	38.7	0.002*
	Current smoker	79.8		67.2		58.2		64.8	
	Past smoker	54.3		64.1		43.1		51.9	
SpO <sub>2</sub>	SpO <sub>2</sub> ≤ 88%	71.2	<0.001*	71.6	<0.001*	54.9	<0.001*	63.3	<0.001*
	SpO <sub>2</sub> > 88%	42.9		54.5		34.2		41.9	
Medications	Inhaled Bronchodilator + ICS	59.2	0.152	63.4	0.595	45.0	0.519	53.5	0.369
	Inhaled Bronchodilator, ICS + Methylxanthine	50.1		60.7		41.7		49.0	

## Discussion

The study showed an impaired QOL among 81 COPD patients using a validated disease specific questionnaire (SGRQ-C). QOL was impaired across all domains; however, activity domain was the most affected while impact domain was the least affected. This study highlights that Neplease COPD patients suffer somewhat higher reductions in QOL (mean total score 52) as do COPD patients from other countries, as reported previously<sup>6,8</sup>. These scores were higher than one study conducted in Nepal<sup>12</sup>. This could be due to the fact that the previous

study was conducted in community setting compared to hospital-based setting in our study.

Smoking had a significant association with QOL score. Various authors have reported similar results<sup>13,14,15</sup>. Smoking is a known risk factor for COPD and increased exposure leads to severe stages of disease leading to poor QOL. Smoking has also been shown to independently impact QOL in a negative way regardless of the presence of COPD<sup>16</sup>.

This highlights the necessity for active interventions by health professionals to help COPD patients quit smoking as a primary tool for adequate management of COPD and patient's QOL.

Among socio-demographic variables, age, gender, occupation and education did not impact QOL in a significant manner. However, the results by other authors in this regard are mixed. Some have shown results similar to us<sup>17,18</sup> with many reporting significant association between age and QOL<sup>13,15,19</sup>.

Gender has been shown to impact QOL in many studies with females reporting poor QOL<sup>19,20</sup>. However, similar to us, some other authors have shown that gender plays no role in the QOL of COPD patients<sup>17,21</sup>. Education has been reported to impact QOL scores but was it was not so in this study<sup>15,19</sup>. The reasons for these are not apparent from our data but may be due to the different social structure and appreciation of education among the Nepalese population. This is an area that warrants further research.

One important finding in this study is that addition of methylxanthines to standard therapy with Inhaled bronchodilators and ICS had no significant effect on the QOL scores. This study thus shows that addition of Methylxanthines in standard treatment of COPD imposes patients to the risk of its adverse effects without any improvement in quality of life.

## Limitations

Number of patients was small and included only those patients who visited tertiary care hospital

## Conclusion

Impairment seen in QOL of Nepalese COPD patients was slightly higher than that in other countries. It was impaired across all domains; however, activity domain was the most affected. This highlight the importance of Pulmonary Rehabilitation programme in COPD

patients. This study strongly discouraged smoking behavior even in established COPD. Similarly as this study shows no benefit of adding methylxanthine to the standard treatment regimen in term of QOL, it will be of great help for treating physicians in clinical decision making.

## Conflict of interest: None declared

## References

1. Guerra S, Sherrill DL, Kurzius-Spencer M, et al. The course of persistent airflow limitation in subjects with and without asthma. *Respiratory Medicine* 2008; 102:1473-82.
2. Silva GE, Sherrill DL, Guerra S, Barbee RA. Asthma as a risk factor for COPD in a longitudinal study. *Chest* 2004; 126:59-65.
3. Ministry of Health and Population, Government of Nepal. Brief profile on tobacco control in Nepal. World Health Organization website.
4. Pandey MR, Smith KR, Boleij JSM, Wafula EM. Indoor air pollution in developing countries and acute respiratory infection in children. *Lancet*. 1989; 333: 427-429.
5. Bhandari R, Sharma R. Epidemiology of chronic obstructive pulmonary disease: a descriptive study in the mid-western region of Nepal. *Int J Chron Obstruct Pulmon Dis*. 2012 (7); 253-257.
6. Jones PW, Prince M, Wijkstra PJ, Patel V, Saxena S, Maj M, *et al*. Quality of life in patients with chronic obstructive pulmonary disease. *Eur Respir Mon* 2006; 38:375-86.
7. Hawthorne G, Richardson J, Osborne R. The Assessment of Quality of Life (AQoL) instrument: A psychometric measure of health-related quality of life. *Qual Life Res* 1999; 8:209-24.
8. Arne M, Lundin F, Boman G, Janson C, Janson S, Emtner M. Factors associated with good self rated health and quality of life in subjects with self reported COPD. *Int J Chron Obstruct Pulmon Dis* 2011; 6:511-9.
9. Tsiligianni I, Kocks J, Tzanakis N, Siafakas N, van der Molen T. Factors that influence disease specific quality of life or health status in patients with COPD: A review and meta-analysis of Pearson correlations. *Prim Care Respir J* 2011; 20:257-68.
10. Schünemann HJ, Griffith L, Jaeschke R, Goldstein R, Stubbings D, Austin P, et al. A comparison of the original chronic respiratory questionnaire with a standardized version. *Chest* 2003; 124:1421-9.
11. Jones PW, Forde Y. St George's Respiratory Questionnaire for COPD Patients (SGRQ-C) Manual 2008. Division of Cardiac and Vascular Science. UK: St George's, University of London.

12. Sherpa CT, LeClerq SL, et al. Validation of the St. George's Respiratory Questionnaire in Nepal. *J COPD* F. 2015; 2(4): 281-289.
13. Miravittles M, Molina J, Naberan K, Cots JM, Ros F, Llor C; EVOCA study. Factors determining the quality of life of patients with COPD in primary care. *Ther Adv Respir Dis* 2007; 1:85-92.
14. Shavro SA, Ezhilarasu P, Augustine J, Bechtel JJ, Christopher DJ. Correlation of health-related quality of life with other disease severity indices in Indian chronic obstructive pulmonary disease patients. *Int J Chron Obstruct Pulmon Dis* 2012; 7:291-6.
15. Hesselink AE, van der Windt DA, Penninx BW, Wijnhoven HA, Twisk JW, Bouter LM, et al. What predicts change in pulmonary function and quality of life in asthma or COPD? *J Asthma* 2006; 43:513-9.
16. Prigatano GP, Wright EC, Levin D. Quality of life and its predictors in patients with mild hypoxemia and chronic obstructive pulmonary disease. *Arch Intern Med* 1984; 144:1613-9.
17. Engstrom CP, Persson LO, Larsson S, Sullivan M. Health-related quality of life in COPD: Why both disease-specific and generic measures should be used. *Eur Respir J* 2001; 18:69-76.
18. Miguel Díez J, Izquierdo Alonso JL, Rodríguez González-Moro JM, de Lucas Ramos P, Bellón Cano JM, Molina París J. Quality of life with chronic obstructive pulmonary disease: The influence of level of patient care. *Arch Bronconeumol* 2004; 40:4317.
19. Ferrer M, Alonso J, Morera J, Marrades RM, Khalaf A, Aguar MC, et al. Chronic obstructive pulmonary disease stage and health-related quality of life: The Quality of Life of Chronic Obstructive Pulmonary Disease Study Group. *Ann Intern Med* 1997; 127:1072-9.
20. Martín A, Rodríguez González Moro JM, Izquierdo JL, Gobartt E, de Lucas P. VICE Study Group. Health-related quality of life in outpatients with COPD in daily practice: The VICE Spanish Study. *Int J Chron Obstruct Pulmon Dis* 2008; 3:683-92.
21. Medinas-Amorós M, Alorda C, Renom F, Rubí M, Centeno J, Ferrer V, et al. Quality of life in patients with chronic obstructive pulmonary disease: The predictive validity of the BODE index. *Chron Respir Dis* 2008