Quality of life of patients with chronic obstructive pulmonary disease in Chitwan, Nepal: a pilot study report

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Abstract

Background: Chronic obstructive pulmonary disease is a major cause of morbidity and mortality worldwide and has a significant impact on an individual's quality of life.

Objective: To assess the quality of life of patients suffering from chronic obstructive pulmonary disease in Chitwan, Nepal.

Materials and Methods: A cross-sectional hospital-based study was conducted in a private hospital among 40 patients with chronic obstructive pulmonary disease. Data were collected from June 8, 2014, to July 8, 2014, using a pretested instrument ($\alpha = 0.954$) with 56 items answered on five-point rating scales. The total score varied from 0 (worst) to 100 (best). The data were analyzed using descriptive and inferential statistics.

Result: The mean score of the total quality of life was 54.97 ± 13.83, while 47.80 ± 16.66 was for physical, 59.26 ± 12.69 for social, and 59.51 ± 15.17 for psychological domains, which showed a higher impairment on physical health. In subscales, the mean score of quality of life was higher on social support (67.34 ± 12.30), whereas lower on symptoms (45.76 ± 19.09) and activities (48.44 ± 18.0 for social and 49.32 ± 16.84 for physical). The quality of life was significantly higher among the patients aged 60–69 years, literate, absence of comorbidity, absence of hospital admission, and not on regular medicine, whereas the quality of life was not associated with sex, marital status, residence, income, duration of diagnosis, and smoking status.

Conclusion: Patients with chronic obstructive pulmonary disease have an impaired quality of life on physical health compared with psychological and social health because of frequent symptoms and limitations on physical activities. Hence, physical health and factors affecting the quality of life need to be considered while planning interventions to improve the quality of life of patients.

KEY WORDS: Patients, chronic obstructive pulmonary disease, quality of life

Introduction

Chronic obstructive pulmonary disease (COPD) is one of the most common respiratory diseases worldwide, and the prevalence is approximately 9%–10% in the middle aged and older population.[1] The prevalence and burden of COPD are projected to increase in the coming decades because of the continuous exposure to tobacco use, indoor air pollution (such as biomass fuel used for cooking and heating) and the changing age structure of the world's population (with more people living longer and, therefore, experiencing the long-term effects of exposure to COPD risk factors).[1,2] The World Health Organization (WHO) estimates that 65 million people have moderate to severe COPD worldwide and more than 3 million people died of COPD in the year 2005. The total deaths from COPD are projected to increase by more than 30% in the next 10 years unless urgent action is taken to reduce the underlying risk factors, especially tobacco use.[3]

Being a chronic and noncurable illness, COPD is associated with physical, psychological, and social problems and

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poorer quality of life (QOL).[4,5] Multiple symptoms burden and impairment in activities of daily living are the common physical problems experienced by people with COPD. Previous studies have identified breathlessness[6–10] and fatigue[6,8] as the most troublesome symptoms, which affect the performance of daily activity levels and decrease the overall QOL.[6,11] Similarly, patients with COPD also experience a great reduction in psychological[12] and social functioning,[9,13,14] which are also associated with the impairment of overall QOL. QOL is associated with breathlessness, physical impairment, reduced activities of daily living, hopelessness, anxiety, and psychological distress.[15–17] Similarly, higher airflow limitation, higher dyspnea, lower level of education, lower body mass index, and depressive symptoms are also associated with worse health-related QOL.[18]

Even though treatment is available, it is unable to improve the survival in patients with COPD or arrest the decline in lung function, and also in addition, the measurement of the severity of disease through spirometry could not explore the patient perception and adaptation with the illness.[19] Therefore, QOL has become an important measure of treatment in patients with COPD. To our knowledge, QOL of patients with COPD has not been previously studied in Nepal. Thus, a cross-sectional survey was undertaken to provide data on QOL of patients with COPD from a selected hospital, using 56-items QOL instrument, which will be useful in identifying a patient's decline or improvement in health status and allowing health-care providers to target the risk groups to intervene accordingly.

Materials and Methods

This is the pilot study report of the main study entitled "Quality of life of patients with chronic obstructive pulmonary disease in Chitwan, Nepal." A cross-sectional survey was conducted among 40 purposively selected patients with COPD in the outpatient department (OPD) of Narayani Samudayik Hospital of Chitwan district, Nepal, from June 8, 2014, to July 8, 2014. The study population consisted of patients aged 40 years and older, who were clinically diagnosed to have COPD for at least 3 months and attending at OPD for follow-up visits. Before the data collection, an ethical clearance was taken from the Institutional Review Board of Tribhuvan University, Institute of Medicine, and the administrative approval was obtained from hospital authority of the selected hospital. A written informed consent was obtained from the patients with COPD.

Data were collected by the researcher with a pretested semi-structured interview schedule. The content validity of the instrument in terms of its adequacy and appropriateness was established by reviewing pertinent literature, consultation with a research advisor, chest physicians, and psychologists. The instrument was first developed in English, then translated into Nepali language, and again back translated into English for the validity of the instrument. On the basis of feedback, necessary modifications were done in the instrument. The

reliability of the instrument was determined using the internal consistency method. The internal consistency of the scale was high in physical, social, and psychological domains and overall QOL items (Cronbach's α = 0.921, 0.812, 0.877, and 0.954, respectively), which indicated that the instrument is highly reliable.

The QOL was assessed by using a 56-item QOL questionnaire, which was developed by the researcher based on St. George Respiratory Questionnaire (SGRQ), SF-36, WHOQOL-BRIEF, Hospital Anxiety and Depression Scale (HADS), and an expert opinion from the subject experts. It consists of three domains: physical health, social life, and psychological functioning; a total score can be calculated as the sum of scores on the three domains. The responses were obtained with reference to the last three months.

Statistical Package for Social Sciences (IBMS SPSS, version 20.0 for window) was used for the data analysis. Categorical variables have been described according to the number and percentage of subjects in each category, and continuous variables have been described using mean and standard deviation (SD). For QOL, each item of the QOL domains is rated in a 5-point rating scale, with a higher score denoting a better QOL. The average of the items contributing to each scale (i.e., raw scores) was calculated first. Then, a linear transformation of the scores was done to standardize the raw scores, so that the scores ranged from 0 to 100. After the transformation, higher scores represented better QOL. The formula applied for linear transformation is as follows:

$$[(\text{Actual raw score} - \text{Lowest possible raw score})/\text{Possible raw score range}]*100.$$

Before inferential analysis, Shapiro–Wilk tests with a confidence level of 95% were conducted to assess the normal distribution of the QOL scores. The data were normally distributed ($p > 0.05$); therefore, independent sample t-test and one-way ANOVA were used to find out the association between QOL scores and selected demographic- and disease-related variables. Pearson's coefficient was used to find out the relationship between the QOL domains. All the statistical significance was set at $p \leq 0.05$.

Result

A total of 40 patients (50% each for men and women) with COPD were included in the study. The mean age of the patients was 71.0 years, ranging from 56.0 to 83.0 years. Seventy percent of the patients were illiterate, 62.5% came from rural area, and 57.5% belonged to the Brahmin ethnicity. Before illness, all the patients were engaged in some kind of occupations (65.0% of them were involved in agriculture), whereas only 52.5% of them were involved in some kind of work currently [Table 1].

The mean duration of COPD was 8.5 years (ranging from 0.5 to 30.0 years). About 88.0% of the patients were on regular medicine, and the mean duration of treatment was 4.30 years (ranging from 0.5 to 16.0 years). Fifty-three percent

Table 1: Sociodemographic characteristics of patients with COPD, *n* = 40

Characteristics	Number (%)
Age (years)	
50–59	6 (15.0)
60–69	8 (20.0)
70–79	22 (50.0)
≥80	4 (10.0)
Mean age (SD), min, max (years)	71.00 (7.59), 56.0, 83.0
Sex	
Men	20 (50.0)
Women	20 (50.0)
Residence area	
Rural	25 (62.5)
Urban	15 (37.5)
Ethnicity	
Brahmin	23 (57.5)
Chhetri	7 (17.5)
Gurung	3 (7.5)
Magar	3 (7.5)
Other	4 (10.0)
Marital status	
Living together	25 (62.5)
Widow/widower	15 (37.5)
Family type	
Nuclear	16 (40.0)
Joint	24 (60.0)
Educational status	
Illiterate	26 (70.0)
Literate	12 (30.0)
Income for 1 year	
Inadequate	3 (7.5)
Adequate	27 (67.5)
Surplus	10 (25.0)

Table 2: Clinical variables of patients with COPD, *n* = 40

Variables	Number (%)
Duration of COPD (years)	
<1	3 (7.5)
1–5	14 (35.0)
6–10	12 (30.0)
>10	11 (27.5)
Mean duration (SD), min, max (years)	8.45 (7.10), 0.5, 30.0
Comorbidity	
Present	21 (52.5)
Absent	19 (47.5)
Types of comorbidities	
Cardiac disease	11 (52.4)
Diabetes	5 (23.8)
Acid peptic disease	4 (19.1)
Osteoporosis	2 (9.5)
Others[a]	3 (14.3)
History of hospital admission	
Yes	9 (22.5)
No	31 (77.5)
Medication for COPD	
Yes	35 (87.5)
No	5 (12.5)
Duration of drug use (years)	
<1	10 (25.0)
1–5	15 (37.5)
>5	10 (25.0)
Mean duration of drug use (SD), min, max (years)	4.30 (4.43), 0.5, 16.0
Oxygen use at home	
Yes	1 (2.5)
No	39 (97.5)

[a]Others: arthritis, gout, and hypothyroidism.

of the patients presented with comorbidities, and the most common comorbidity was cardiac problems (52.4%). Similarly, 23.0% of all the patients had been hospitalized due to an exacerbation, and 77.8% of them had been admitted in the hospital only once [Table 2]. In terms of COPD-related risk factors, 95.0% of the patients showed a history of smoking, and 25.0% of them were still smoking cigarette. In addition to smoking, 78.0% and 85.0% of the respondents revealed a history of exposure to passive smoking and occupational health hazards such as dust, chemical, and smoke (not shown in table).

In regard to the QOL, the mean score was 54.97 ± 13.83, which is just above the mean. In subscales, the mean score of QOL was higher in psychological and social domain. Similarly, patients' mean scores of QOL were higher in social support (67.34 ± 12.30) and behavior (66.88 ± 31.21), whereas lower in physical symptoms (45.76 ± 19.09) and activity (49.32 ± 16.84). The most troublesome symptoms reported by patients were dyspnea (21.25 ± 25.03), cough (33.75 ± 33.27), and sputum production (35.00 ± 33.87) [Table 3].

In this study, a significant difference was observed on QOL score among the different age groups (*p* = 0.027); it was also found that patients aged 80 years and older showed a significantly lower QOL compared with lesser age groups. Similarly, literate patients showed a significantly higher QOL score [62.16, confidence interval (CI): 56.32, 67.95] compared with illiterate patients (52.88, CI: 46.27, 57.50). Likewise, patients without any reported comorbidities revealed a significantly higher QOL score (59.74, CI: 52.98, 66.50) compared with patients with reported comorbidities (50.65, CI: 44.99, 56.31). Moreover, patients without reported history of hospital admission for breathing problems in the last 3 months presented a significantly higher QOL score (57.29, CI: 52.49, 62.09) compared with patients with a reported history of hospital admission (46.97, CI: 36.16, 57.78). Furthermore, patients who needed medicine regularly for their breathing problems showed a significantly lower QOL score (53.16, CI: 48.47, 57.84) compared with patients who did not require medicine regularly (67.64, CI: 58.52, 76.75). However,

Table 3: QOL scores on different domains, *n* = 40

Scores	Transformed score, mean (SD)	Range
Total QOL	54.97 (13.83)	26.36–77.73
Physical domain	47.80 (16.66)	14.29–82.14
Symptom scale	45.76 (19.09)	13.89–77.78
Activity scale	49.32 (16.84)	14.58–95.83
Social domain	59.26 (12.69)	28.13–84.38
Social relationship	53.91 (16.24)	18.75–81.25
Social support	67.34 (12.30)	34.38–96.88
Social activity	48.44 (18.00)	0–75
Psychological domain	59.51 (15.17)	33.33–87.5
Emotional feeling	55.36 (16.85)	28.57–85.71
Cognitive functioning	61.69 (14.97)	32.5–87.5
Behavior or activity	66.88 (31.21)	25–100

Higher scores indicate higher quality of life or fewer problems. Possible score: 0–100.

Table 4: Difference in QOL scores according to sociodemographic characteristics, *n* = 40

Characteristics	*n*	Independent sample test/ANOVA		
		Mean (95% CI)	*t/F*	*p*
Age (years)				
50–59	6	54.92 (44.96, 64.89)	3.418	0.027
60–69	8	58.24 (44.54, 71.94)		
70–79	22	57.25 (51.81, 62.69)		
≥80	4	35.91 (19.81, 52.05)		
Sex				
Women	20	50.77 (43.58, 57.96)	−1.989	0.054
Men	20	59.16 (54.04, 64.28)		
Education				
Illiterate	28	51.88 (46.27, 57.50)	−2.265	0.029
Literate	12	62.16 (56.37, 67.95)		
Marital status				
Married	25	53.35 (50.50, 60.19)	−0.201	0.842
Widow/widower	15	54.33 (44.80, 63.86)		
Work status				
Not working	22	55.33 (49.48, 61.18)	0.18	0.856
Working	18	54.52 (47.09, 61.95)		
Residence				
Rural	25	53.05 (47.09, 50.02)	−1.133	0.264
Urban	15	58.15 (51.20, 65.10)		
Economic status				
Inadequate	3	45.76 (29.62, 61.90)	0.952	0.118
Adequate	27	54.76 (49.01, 60.51)		
Surplus	10	58.27 (48.99, 67.56)		

p significant at ≤0.05 level.

there was no significance difference on QOL scores with regard to sex, marital status, place of residence, family type, work status, economic status, duration of COPD, and smoking status [Tables 4 and 5].

This study found that there was a significant relationship between all the domains of QOL (*p* < 0.001); particularly, there

Table 5: Differences on QOL scores according to clinical variables, *n* = 40

Variables	*n*	Independent sample test/ANOVA		
		Mean (95% CI)	*t/F*	*p**
Duration of COPD (years)				
<5	17	55.67 (47.94, 63.40)	0.273	0.79
≥5	23	54.45 (48.74, 60.15)		
Current smoker				
Yes	10	52.86 (41.83, 63.89)	0.55	0.585
No	30	55.67 (50.64, 60.70)		
Comorbidity				
Absence	19	59.74 (52.98, 66.50)	2.172	0.036
Presence	21	50.65 (44.99, 56.31)		
Hospital admission in the last 3 months				
Absence	31	57.29 (52.49, 62.09)	2.050	0.047
Presence	9	46.97 (36.16, 57.78)		
Need of medicine regularly				
No	5	67.64 (58.52, 76.75)	2.309	0.026
Yes	35	53.16 (48.47, 57.84)		

*Independent samples' test; *p* significant at ≤0.05 level.

Table 6: Relationship among physical, psychological, and social domains scores of QOL, *n* = 40

QOL domains	*r**	*p*
Physical vs. social domains	0.737	<0.001
Physical vs. psychological domain	0.746	<0.001
Psychological vs. social domain	0.86	<0.001

*Pearson correlation; *p* significant at ≤0.05 level.

was a strong correlation between psychological and social domains (*r* = 0.86, *p* < 0.001) [Table 6].

Discussion

Patients with COPD are frequently impaired in their physical health, social life, and psychological function. In this study, patients with COPD showed higher mean QOL scores (54.97 ± 13.83) compared with the studies conducted elsewhere.[15,20,21] This can be explained by the fact that the majority of patients in this study were elderly people and staying in joint family where family members are responsible for caring and supporting each others.

With respect to different components of QOL, it is notable that the patients' QOL was significantly lower in the physical health (symptoms and activities) compared with psychological and social health. This finding can be explained by the fact that patients develop dyspnea and exhaustion immediately following any activities because of irreversible progressive airway obstruction. This is consistent with other studies that showed lower QOL score for the physical component especially in symptoms and activity subscales among patients with COPD.[21–24] Some studies reported that the symptoms burden (breathlessness), reduced activities of daily living, and

physical impairment presented significant impacts on physical health component of QOL.[17,25]

Dyspnea, cough, problem of sputum and wheezing were the most troublesome symptoms found among the patients in this study. These findings were consistent with the previous study, which mentioned the classic symptoms of COPD such as coughing, wheezing, and shortness of breath and limitation in performing many general activities.[24] The symptoms distress and activity limitations among patients with COPD are associated with poor QOL,[25,26] and pulmonary rehabilitation is effective to develop confidence in managing breathlessness and a loss of fear of activity.[27]

There was no significant difference on QOL scores between men and women, which was also supported by the study conducted in Sweden.[22] However, other studies showed women with worse QOL compared with men.[21,23,28] This probably again can be attributed to the joint family practice in our setting.

This study, along with some other studies,[22,29] found that there was association between QOL and age groups and confirmed that the older patients with COPD (80 years and older) reported more compromised QOL. This finding can be explained by the fact that majority of the patients included in the study were elderly patients and smokers. Severity of the disease increases as a result of cumulative effects of smoking and the age-related physiological deterioration in lung function. However, inconsistent results were reported in some other studies stating that the age of patients with COPD did not significantly influence the health-related QOL.[21,25]

This study also found that literate patients showed a significantly higher QOL compared with illiterate patients ($p = 0.029$). This finding is consistent with the study of Garrido et al.,[23] which found education as an influencing factor of QOL. The reason behind this may be because of disease awareness, self-care management, and early health-seeking behaviors of the educated population.

With regard to the duration of diagnosis, this study found that there was no significant difference on QOL and duration of illness. However, the association between duration of COPD and QOL is controversial. Some studies have detected an association between the two parameters,[30] while other have found that the longer duration of illness is related to more health status symptoms and psychosocial impact but not related to overall QOL.[15]

In relation to smoking habit, this study found no difference on QOL between current smokers and nonsmokers, which is also consistent with the study conducted in Sweden.[22] The possible reason behind this may be that once the disease process sets in, further exposure to the smoking does not have much influence in overall QOL. In addition, the subjects who do not quit smoking may be those with a less severe stage of disease. However, a study conducted in Nigeria[21] found that the previous heavy smokers showed a worse QOL score in the symptom subscale compared with nonsmokers.

The presence of comorbidities was associated with a reduced QOL of patients with COPD in this study, which is consistent with the studies conducted in the Netherlands[31] and Spain.[32] It is interesting to note that the impact on QOL was higher when patients revealed other co-morbidities in addition to COPD. This finding is in agreement with the Global Initiatives for Chronic Obstructive Lung Disease (GOLD) approach stating that comorbidities should be looked for routinely and treated appropriately, in any patient with COPD.[2]

This study found an impaired QOL among patients with COPD with a reported history of hospital admission in the last 3 months. This supports the other studies of Spain[33] and France,[34] which found the decreased QOL with increased number of hospitalizations for exacerbations in the previous year. This result can be explained by the facts that patients with COPD who require hospitalizations for exacerbation may acutely lose as much as 30% of their premorbid lung function. The reduction in lung functions and associated symptoms deteriorates the patients QOL.[35] Therapeutic interventions have demonstrated a reduction in exacerbations and associated hospitalizations.

In this study, there were strong correlations among physical, psychological, and social domains of QOL. This finding is consistent with the study conducted in Norway, which showed a high intercorrelation between total QOL and its components.[15] The highest correlations among the three domains of QOL in this study indicated that all domains are equally important and somehow interdependent as well.

The finding of this study has to be considered with reference to its study limitations. The cross-sectional design of the study limits the ability to describe how health-related QOL changes with time period. Patients were recruited from those who visited in the OPD of only one private hospital and, therefore, may not represent the COPD population at large. The staging of COPD and their QOL could not be explored because of lack of application of spirometer in clinical setting. The study was conducted in only one setting, which could not be generalized to other settings.

Conclusion

Patients suffering from chronic obstructive pulmonary disease have an impaired quality of life especially on physical health compared with psychological and social health owing to the frequent experience of symptoms and limitation on their physical activities. A highest correlation among all the domains of QOL indicates that the impairment in one domain may affect the other domains as well. Older age, lower education, reported co-morbidity, frequent hospital admission, and the need of medicine regularly were associated with a lower QOL of patients with COPD who attended the OPD. Hence, all the domains of QOL and the factors affecting QOL need to be considered while planning interventions to improve the QOL of patients with COPD.

Acknowledgment

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