Self-Care Practice among Patients with Chronic Obstructive Pulmonary Diseases

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ABSTRACT

Background: Self-management behaviour is crucial for halting the progression of the disease and preventing exacerbations and hospitalizations in patients with chronic obstructive pulmonary diseases. Hence, this study aimed to assess self-care practice among patients with chronic obstructive pulmonary diseases attending at a teaching hospital.

Methods: Cross-sectional study was carried out among 106 patients who were diagnosed to have Chronic Obstructive Pulmonary Diseases and attending at respiratory and critical care medicine department of Chitwan Medical College Teaching Hospital. Convenience sampling technique was used to select 106 samples for the study. Structured interview schedule and observation checklist were used to collect the data. Data analysis was performed in SPSS version 23 for window using descriptive and inferential statistics.

Results: The finding of this study revealed that 50.0% of patients with Chronic Obstructive Pulmonary Diseases had high and 50.0% had low self-care practice. Only 5.7% were using inhaler correctly whereas 94.3% of patients were using inhaler incorrectly, Furthermore, marital status, ethnicity and level of depression were found to be the significant factors associated with self-care practice of the patients.

Conclusions: Half of the patients with chronic obstructive pulmonary diseases have low self-care practice whereas almost all are using inhaler incorrectly. Hence, self-management intervention program is needed for the patients with chronic obstructive pulmonary diseases to enhance their knowledge and skill on self-care practice including inhaler use.

Keywords: Chronic obstructive pulmonary diseases; patients; self-care practice.

INTRODUCTION

Chronic Obstructive pulmonary Disease (COPD) is listed as one of the top three cause of death worldwide.[1,2] Evidence reported that COPD is in increasing trend in Nepal.[3] Self-care encompasses self-identification, symptom management, medication, diet, dyspnoea coping, smoking cessation, and exercise.[4] Self-care is crucial for managing progressive, incurable illnesses and preventing complications. Studies have shown that self-care boosts COPD patient quality of life, cuts hospitalization costs, lowers emergency visits, aids in health decisions, and enhances condition management.[5,6] Whereas poor self-management behaviours increase symptoms burden, functional impairments and decrease the quality of life.[5] Multiple factors (education, family history, social support, socioeconomic status, resources, and educational materials) linked to poor COPD self-management.[7-9] Hence, this study aimed to find out the self-care practice among patients with COPD and factors associated with it.

METHODS

Cross-sectional study design was carried out in the respiratory and critical care department of Chitwan Medical College-Teaching Hospital (CMC-TH), Bharatpur-10 among COPD patients who were clinically diagnosed to have COPD according to Global Initiative for Chronic Obstructive Lung Disease (GOLD) diagnostic criteria.[1] This study included those patients who met the following

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criteria: (i) patients who were diagnosed as COPD cases based on Spirometry (FEV1/FVC ratio <0.7) and had history of illness for at least 3 months (ii) age ≥18 years (iii) has GOLD stage III or less and (iv) who has undergone regular treatment for COPD for at least 3 months (iv) and willing to participate in the study.Patients who had(i) problems in seeing, hearing and speaking (ii) had other severe co-morbidities and psychiatric disorders were excluded from this study. Sample size was calculated by using Cochran formula (1977) = $(z)^2pq/e^2$, considering 86.1% prevalence (p) of previous study[10], 95% confidence level (z=1.96), 10% allowable error (e=0.01) and total number of COPD patients (N=200) attended in the OPD for the last 6 months. Calculated final sample size was 106.Convenience sampling technique was used and those patients who came during data collection period and met the study criteria were taken as study sample.

In this study, structured interview schedule containing Modified Medical Research Council (mMRC) Dyspnoea Scale[11],COPD Assessment Test (CAT)[12], Patient Health Questionnaire-9 (PHQ-9),[13] Generalized Anxiety Disorder-7 (GAD-7),[14] COPD Self-Management Practice Questionnaire (SMPQ), and Observation Checklist were used to collect the data. Structured interview schedule was developed for the socio-demographic and clinical information and other tools such as mMRC *Dyspnoea Scale*, CAT scale, PHQ-9 and GAD-7 were used for the assessment of dyspnoea, COPD symptom burden, depression and anxiety respectively. Self-care practice was assessed using SMPQ through face to face interview method. *SMPQ containing 23 items in 5 domains* (symptom management-6, daily life management-8, emotion management-5, information management-3, and self-efficacy-1) was developed by adopting 18 items of SMPQ tool[9] and 5 additional items were added based on the review of literature to cover the full aspects. Each item were graded on 5-point scales where 1=never, 2=rarely, 3=sometimes, 4=often, and 5 = always. Total possible score ranged from 23-115. Total score was calculated by summing 23 items and further classified into two groups based on the median value (61.5) as low self-care practice (<61.5) and high self-care practice (≥61.5). Observation checklist containing 11 steps (2 critical steps and 9 general steps) was used to assess step wise performance of inhalation technique of DPI or MDI inhaler device by patients with COPD at OPD of CMC-TH. Rotahaler device and placebo rotacaps were provided to them. Each respondent was observed one by one. Each statement was rated to 0 to 1 score, where 0- incorrectly performed and 1-correctly performed. Total practice score was calculated and further classified into 2 categories as correct practice (performing at least 90% of total steps including 2 critical steps) and incorrect practice (performing less than 90% of total steps or missing 2 critical steps).

Content validity of structured interview schedule and observation checklist was established by extensive literature review and consultation with research advisor and subject experts. Firstly, the instrument was developed in English language. Then it was translated into Nepali version with the help of language experts and again back translated into English version through third person translation. Pretesting of the *SMPQ* was done among 50 patients with COPD at medicine outpatients department of CMC-TH and Cronbach's α coefficient for the scale was 0.83 indicating good internal consistency. For Interrater reliability, two team members observe the inhalation technique of 10 COPD patients using same structured observation checklist and calculated reliability coefficient was 0.85.

Ethical clearance was taken from Institutional Review Committee of Nepal Health Research Council (Ref. No.1908). Data collection permission was obtained from Chitwan Medical College-Institutional Review Committee (Ref: CMC-IRC/078/079-055). Data were collected by researchers themselves from 1st February 2022AD to 30th April, 2022 AD using Nepali version instruments. First, patients were identified from their OPD ticket which was issued from the OPD counter of the hospital. The purpose of the study was explained to them and written informed consent was obtained. Data were collected during OPD time (8am-4pm) in a separate room or corner of OPD using curtain or screen to maintain the privacy. First, socio-demographic characteristics, disease and treatment and self-care practice related information were collected. Then, respondents were asked to show their inhalation technique through rotahaler device. Hospital number was also used as responder's identification number to avoid repetition of data.

All the collected data were analysed using SPSS version 23.0. Descriptive statistics was used to describe the variables. Chi-square test was performed to measure the association between dependent and independent variables. Logistic regression model was constructed to find out the factors associated with self-management practice. Those variables whose p value is <0.1 in bivariate analysis were included in the model construction. Hosmer and Lemeshow testwas applied to test the model fitness. Level of statistical significant was set at p<0.05.

RESULTS

Nearly half (46.2%) of the respondents belonged to the 65-74 years age group. Majorities were females (64.2%), followed Hindu religion (84.0%), belonged to joint family (83.0%), illiterate (55.7%), had monthly income just

enough to support their family (67.9%) and had taken health insurance facility (73.6%) [Table 1].

Table 1. Socio- Demographic Characteristics of the Respondents. (n= 106)

Variable	Number	Percentage
Age group in years		
50-64	21	19.8
65-74	49	46.2
75 and above	36	34.0
Mean age (SD): 70.43 (±7.82) year, Min:50 year, Max-86 year		
Sex		
Male	38	35.8
Female	68	64.2
Religion		
Hindu	89	84.0
Buddhist	11	10.4
Christian	4	3.8
Others	2	1.9
Ethnicity		
Brahmin	54	50.9
Chhetri	15	14.2
Janajati	30	28.3
Others	7	6.6
Marital status		
Married and with spouse	67	63.2
Widow/widower	39	36.8
Type of family		
Nuclear	18	17.0
Joint	88	83.0
Educational status		
Illiterate	59	55.7
Literate	47	44.3
Occupation		
Agriculture	19	17.9
Homemaker	31	29.2
Business	5	4.7
No work	48	45.3
Others(daily wages/labour)	3	2.8
Monthly family income		
Not enough	19	17.9
Just enough	72	67.9
Surplus	15	14.2
Health insurance facility		
Yes	78	73.6
No	28	26.4
Quitting of job due to illness		

Yes	52	49.1
No	54	50.9

Out of 106 respondents, more than half of respondents (49.1%) had COPD for more than 5 years. Few (14.2%) were still smoking cigarette after diagnosis of illness. Nearly two third (60.4%) had other chronic co-morbid conditions, 85.7% were DPI users, 34.0% suffered from moderate to severe anxiety and 44.5% had depression(Table 2).

Table 2. Disease and clinical related Information of the Respondents. n=106

Variables	Number	Percentage
Duration of COPD		
Less than 1 year	13	12.3
1-5 year	41	38.7
Above 5 year	52	49.1
Median duration of COPD (IQR): 5 (3-8.5) year Min: 0.4 year Max: 35 year		
Smoking status		
Non-smoker	9	8.5
Ex-smoker	82	77.4
Current smoker	15	14.2
Presence of co-morbidities		
Yes	64	60.4
No	42	39.6
Type of inhaler use		
MDI	15	14.2
DPI	91	85.8
Depression status		
None (<5)	29	27.4
Mild (<5 - <10)	34	32.1
Moderate (10 - <15)	25	23.6
Moderately severe (15-20)	17	16.0
Severe (>20)	1	0.9
Anxiety status		
None (<5)	39	36.8
Mild (5 - 9)	31	29.2
Moderate (10-14)	21	19.8
Severe (≥15)	15	14.2
COPD Symptoms burden		
Mild (<11)	17	16.0
Moderate (11-20)	35	33.0
Severe (21-30)	43	40.6
Very severe (31-40)	11	10.4
COPD severity		
Moderate (Post-bronchodilator FEV_1/FVC <0.7, FEV_1≈50%-80% predicted)	93	87.7

Severe (Post-bronchodilator FEV_1/FVC <0.7, FEV_1≈30%-50% predicted)	13	12.3
Mean % of FEV1/FVC (±SD): 60.84 (±7.99)Min: 38.65 Max: 69.0		

Table 3 shows that only half of respondents had high self-care practice whereas half had low self-care practice. Very few (5.7%) respondents used inhaler correctly whereas almost all (94.3%) used inhaler incorrectly.

Table 3. Respondents' Self Care and Inhaler Practice. n=106

Variables	Number	Percentage
Self-care practice		
Low (<61.5)	53	50.0
High (61.5 and above)	53	50.0
Inhaler practice		
Inadequate ((<90% of total steps)	100	94.3
Adequate (>90% with 2 critical steps)	6	5.7

Self-care practice was significantly associated with sex (p=0.002), marital status (p=0.000), religion (p=0.006), educational status (p=0.019) and job quitting (p=0.032), anxiety (p=0.001) and depression status (p=.000) of the respondents (Table 4].

Table 4. Association between Self-care Practice and Selected Variables. n=106

Variables	Self-care Practice		χ^2	p-value
	High No. (%)	Low No. (%)		
Age group in year			5.295	0.072
50-64	10 (47.6)	11 (52.4)		
65-74	30 (61.2)	19 (38.8)		
≥75	13 (36.1)	23 (63.9)		
Sex			10.502	**0.002**
Male	27 (71.1)	11 (28.9)		
Female	26 (38.2)	42 (61.8)		
Marital status			14.644	**0.001**
Married	43 (64.2)	24 (35.8)		
Widow/widower	10 (25.6)	29 (74.4)		
Type of family			0.000	1.000
Nuclear	9 (50.0)	9 (50.0)		
Joint	44 (50.0)	44 (50.0)		
Ethnicity			11.994	**0.006**
Brahmin	34 (63.0)	20 (37.0)		
Chhetri	9 (60.0)	6 (40.0)		
Janjati	8 (26.7))	22 (73.3)		
Others	2 (28.6)	5 (71.4)		
Educational status			6.460	**0.019**
Illiterate	23(39.0)	36 (61.0)		
Literate	30 (63.8)	17 (36.2)		
Quitting of job due to illness			5.436	**0.032**
Yes	20 (38.5)	32 (61.5)		
No	33 (61.1)	21 (38.9)		

Table 4. Association between Self-care Practice and Selected Variables. n=106

Variables	Self-care Practice		□²	p-value
	High No. (%)	Low No. (%)		
Annual Income				
Not enough to eat for one year	8 (42.1)	11 (57.9)	0.596	0.835
Just enough to eat for one year	37 (51.5)	35 (48.6)		
Surplus for future	8 (53.3)	7 (46.7)		
Anxiety status				
None	26 (66.7)	13 (33.3)		
Mild	18 (58.1)	13 (41.9)	14.140	<0.001
Moderate to severe	9 (25.0)	27 (75.0)		
Depression status				
None	25 (86.2)	4 (13.8)		
Mild	12 (35.3)	22 (64.7)		
Moderate	9 (36.0)	16 (64.0)	20.997	<0.001
Moderately severe to severe	7 (38.9)	11 (61.1)		
Presence of co-morbidity				
Yes	36 (56.3)	28 (43.8)		
No	17 (40.5)	25 (59.5)	2.524	0.164
Duration of COPD				
< 1 year	5 (38.5)	8 (61.5)		
1-5 years	22 (53.7)	19 (46.3)	0.912	0.683
≥5 years	26 (50.0)	26 (50.0)		
COPD severity				
Moderate	46 (49.5)	47 (50.5)		
Severe	7 (53.8)	6 (46.2)	0.088	1.000
COPD symptoms burden				
Mild	10 (58.8)	7 (41.2)		
Moderate	20 (57.1)	15 (42.9)	3.726	0.307
Severe	20 (46.5)	23 (53.5)		
Very severe	3 (27.3)	8 (72.7)		

**Fisher's exact test* *Significant levelat p<0.05*

A logistic regression model explained 50.1% (Nagelkerke R^2: 0.501) variance in self-care practice of the respondents. Those respondents, who were married and living with spouse, belonged to Brahmin ethnicity and had no depression had high self-care practice after adjusting gender, education and anxiety level (Table 5).

Table 5. Logistic Regression Model on Factors of Self-Care Practice of COPD Patients.

	Unstandardized *B*	P	Standardized *B*	p	95% CI for *B*
Gender					
Male	3.965	0.002	2.220	0.242	0.583, 8.447
Female	Ref		Ref		
Marital Status					
Living with spouse	5.196	<0.001	4.779	0.007	1.529, 14.939

Table 5. Logistic Regression Model on Factors of Self-Care Practice of COPD Patients.

	Unstandardized *B*	P	Standardized *B*	p	95% CI for *B*
Widow/widower	Ref				
Ethnicity					
Brahmin	4.590	0.001	5.508	0.005	1.692, 17.925
Chhetri	4.050	0.030	4.783	0.064	0.914, 25.029
Janajati and Dalit	Ref				
Education					
Literate	2.762	0.012	1.309	0.679	0.365, 4.694
Illiterate	Ref				
Quitting of Job					
Yes	Ref	0.021	0.992	0.989	0.338, 2.914
No	2.514				
Anxiety status					
None	0.338	0.010	0.471	0.286	0.118, 1.880
Present	Ref				
Depression status					
None	0.091	<0.001	21.881	0.004	2.747, 177.793
Present	Ref				

Hosmer and Lemeshow test (x^2=4.838, p=0.775), Nagelkerke R^2=0.501

DISCUSSIONS

Adequate self-care practice enables people to develop the abilities and behaviours needed to effectively manage their disease and any related psychological and practical issues.[15] Hence, it has been concern in patients with COPD in Nepal. This study revealed that only half of patients with COPD have high self-care practice and very few use inhaler correctly. Marital status, Brahmin ethnicity and depression status are the identified factors of self-care practice.

In this study, only half of the patients with COPD had high self-care practice whereas half had low self-care practice. Similarly, other studies reported COPD patients had unsatisfactory self-care management in Nepal[15] and other parts of world.[16] However, studies from China[10], USA[17] and Norway[18] reported higher self-care practices compared to our study findings. This variation could be due to the difference in setting and measurement tools used in study. Inadequate self-care stems from doctors prioritizing prescriptions and patients favouring medication over lifestyle changes.[9]

Inhalation techniques are important skills and techniques related to medication adherence in COPD.[11] This study showed that almost all (94.3%) of the patients with COPD had used inhaler incorrectly whereas only 5.7% used the inhaler correctly. This finding is similar with the study conducted in Nepal where only 11.4% of respondents used inhalers correctly.[19] Other studies in Nepal revealed varied result on use of inhaler correctly i.e.5.7%[20] to 37%.[21] This incorrect inhaler use may be a result of patients' lack of interest, carelessness, or inability to read the instruction page, as well as health professionals' inappropriate inhaler use instructions.[22]

Anxiety and depression are more common in COPD patients than in the general population.[23] In this study, prevalence of emotional problems (moderate to severe anxiety-34.0% and depression-40.5%) were high among COPD patients which is consistent with a finding of systematic review which showed the most common co-morbidities as anxiety (40%) and depression (25%) in COPD patients.[24] Previous studies also reported the prevalence of anxiety and depression among COPD patients in China [25], India[26], Norway[27], and Pakistan.[28]

Bivariate analysis of this study findings revealed the significant association of self-care practice with sex (p=0.002), marital status (p=0.000), religion (p=0.006), educational status (p=0.019) and job quitting (p=0.032). This finding is supported by other studies which revealed

significant association between self-care practice with age, marital status[8] and educational status of patients with COPD.[9] It indicates that literate people have high self-care practice. The possible reason could be that Illiterate people may have a poorer understanding of self-management skills including information management, symptoms management, daily lifestyle management, emotional management, and self-efficacy. As a result they have poor self-management practice. Hence, while developing self-management interventions, consideration should be given to educational levels, particularly in COPD patients who tend to be less educated.

Our study found that there was no association between self-care management practice with family income and co-morbidity which is similar to the findings of the study done in Nepal which showed no association between self-care management practice andco-morbidity.[9] The possible reason could be that who have been suffering from multiple morbidities may have sought more consult with health personnel and may get more information on the disease and available health services that they have been able to apply different activities such as physical activity, smoking cessation etc. However, other studies reported that patient with COPD with co-morbidity[18] and had a low family income [9,29] had poor self-care management practice.

This study revealed that depression was strong predictors of the self-care practice i.e. patients with depressive symptoms had low self-care practice compared to patients without depressive symptoms ($p < 0.001$). This finding is consistent with a study conducted in the Turkey which discovered that presence of depression or anxiety has a negative effect on self-care agency of COPD patients.[30] Hence, regular screening of psychological problems help to boost the self-care practice of patients.

This study adds to the dearth of information regarding status of self-care practice and inhaler use in patients with COPD as well as factors associated with it in Nepalese context. This study finding might be helpful to health care providers and health institutions to develop and enforce a health teaching protocol containing clear instructions on self-care practice for the patients with COPD. Still this study has certain limitations: (i) It adopted a cross-sectional study design which could not explore the true cause and effect relationship (ii) It is conducted in a single setting among OPD attended patients with COPD so the results may not be generalized to patients with very severe disease and (iii) Use of self-reported questionnaires to measure self-care practice in the study could have some socio-desirability bias.

CONCLUSIONS

In conclusion, this study showed that half of patients with COPD have high self-care practice whereas half have low self-care practice. However, most of the patients are using inhaler incorrectly. Marital status, ethnicity, and status of depression are the identified factors determining the self-care practice of patients with COPD. Thus, regular assessment of self-care practice including inhaler use and screening of psychological problems is crucial for the early identification and timely management of patients. The findings are expected to contribute to design self-management programs to boost self-care practice and improve disease outcomes in patients with COPD.

CONFLICT OF INTEREST

There are no conflicts of interest.

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