Enferm Clin. 2019;29(S2):159–165

Enfermería Clínica

www.elsevier.es/enfermeriaclinica

Relationship between severity and quality of life in chronic obstructive pulmonary disease patients at hospitals' outpatient units in Jakarta☆

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Received 13 November 2018; accepted 17 April 2019
Available online 29 July 2019

KEYWORDS
Chronic obstructive pulmonary disease (COPD);
Health-related quality of life (HRQOL);
Classification of ABCD Groupings;
GOLD

Abstract
Objective: The aim of this study was to assess the quality of life associated with the health of patients with COPD.
Method: The design of this study used a cross-sectional with convenience sampling method in 200 stable COPD patients, who had suffered COPD for more than 3 months but who did not have stage 3 or stage 4 chronic heart failure, at three Hospital in DKI Jakarta. Groups A to D were divided based on the COPD Assessment Test (CAT), the exacerbation category using the recommendation from GOLD, and the quality of life questionnaire using the St. George's Respiratory Questionnaire (SGRQ).
Results: The chi-square analysis showed that $p = 0.000$ ($p < 0.05$), indicating that there was a difference of proportion between Group A, Group B, Group C, and Group D, which means that there is relationship between the ABCD Groupings classification on the quality of life.
Conclusions: This study shows that there is a relationship between severity using ABCD Groupings Classification and the quality of life for COPD patients.

Introduction

According to the Global Initiative for Chronic Obstructive Pulmonary Disease (GOLD), chronic obstructive pulmonary disease (COPD) is a non-communicable disease of the respiratory tract. More than 3 million people died from COPD in 2012 and it accounted for 6% of all deaths worldwide.

☆ Peer-review under responsibility of the scientific committee of the Second International Nursing Scholar Congress (INSC 2018) of Faculty of Nursing, Universitas Indonesia. Full-text and the content of it is under responsibility of authors of the article.

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https://doi.org/10.1016/j.enfcli.2019.04.024
1130-8621/

COPD is the fourth leading cause of death in the world but will develop into the third leading cause of death by 2020.[1] The data in Indonesia, which is based on the Basic Health Research 2013 (Riskesdas), stated that the prevalence of COPD is 3.7% among those who are 55–75 years-old and that the incidence of this disease increases with increasing age more in men (4.2%) than women (3.3%). The rise of COPD prevalence in the foreseeable future is due to the increase of air pollution exposure and the number of elderly, which are risk factors for COPD.[1] Thus, the prevention, early diagnosis, and correct handling of COPD around the world are needed.[2]

The assessment, handling, and treatment of COPD patients have recently been revised into Groups A–D according to the latest GOLD classification.[3] In this classification, the symptoms are assessed through the COPD Assessment Test (CAT) score or by using a modified Research Council (mMRC) scale and evaluating the future risk of pure exacerbations based on the history of exacerbations.[4] Because the main goal of treatment in COPD is to reduce the symptoms, frequency, and severity of exacerbations and to improve health status, it seems clear why this clinical assessment tool has been suggested. This classification also relates to quality of life in patients with COPD.[5]

Research conducted by Boland, Tsiachristas, Kruis, Chavannes, and Mölken (2014) in the Netherlands identified a strong relationship between the classification of the ABCD Groupings and the quality of life in patients with COPD. The results of this study indicated that patients in Group B, Group C, and Group D have a much worse quality of life than in Group A. In contrast, research conducted by Barusso et al. (2015) in Brazil identified that 49.3% of respondents in Group D had a good quality of life and was followed sequentially by Group B (41.8%), Group C (26.9%), and Group A (25.8%). Based on the research above it can be concluded that each ABCD classification group has a different quality of life.

Quality of life is an important indicator in the treatment of COPD patients. Thus, this cross-sectional study was conducted to provide data on the quality of life according to the latest ABCD grouping classification in three hospitals in Jakarta by using the St. George's Respiratory Questionnaire (SGRQ) instrument. This study is useful to identify the development or improvement of the quality of life in patients with COPD, which is one of the goals in nursing care.

Method

Design and sample

This study analyzed the relationship between the severity of symptoms, using the ABCD Groupings classification, and the quality of life of COPD patients. This was a quantitative study with a cross-sectional approach conducted on 200 COPD patients in Persahabatan Hospital, Budi Asih Hospital, and Pasar Minggu Hospital in Jakarta from May to June 2018. The sampling technique used was convenience sampling. The population of this study was those who have been diagnosed with COPD for at least 3 months, who were not experiencing severe physical discomfort, and who did not have grade III and IV heart diseases.

Data collection, ethical considerations, data analysis

Data collection was carried out after passing the ethical review at Universitas Indonesia and the chosen hospital authority. Written informed consent was obtained from the patients and data was collected by the researchers through filling out the questionnaire. The independent variables were the ABCD classification based on symptoms using the eight-question CAT and the history of exacerbations in the previous 12 months, including hospitalization, as described in GOLD 2017.[1,6] The dependent variable was assessed using the SGRQ instrument by Jones, which contains 50 questions.[7] The results of the validity and reliability test on the SGRQ instrument have been carried out in a previous study by Ika Setyo Rini in 2011. The study's statistical analysis was univariate and bivariate with a chi-square analysis.

Results

The majority were males (67.5%), married (71%), and attended elementary or junior high school (44%) [Table 1]. Findings of our study showed that the patients had a mean age of 61.76 years old, ranging from 22 to 84 years old [Table 2]. Their family earnings were 2 million rupiahs per month, with the lowest earning was 500 thousand rupiahs and the highest was 25 million rupiahs [Table 3]. Their BMI score was within normal range, both among female (30.8%) and male patients (43.7%) [Table 1].

On average, the patients had been diagnosed with COPD for 12 months [Table 3]. The majority had no comorbidities (44.5%) and had no exacerbation history (67%) [Table 4]. Nevertheless, more than three quarter experienced moderate to severe dyspnea (77.5%) [Table 4]. Over half were smokers (56.5%) of filter cigarettes (56.6%) with less than 20 cigarettes consumption per day [Table 4].

As shown in Table 5 COPD severity classification by patients' characteristics using grouping ABCD. The relationship analysis of the severity of symptoms using the ABCD Groupings Classification and the quality of life showed that, of the 200 respondents, 35 people from Group A (21.9%), 76 from Group B (47.5%), 10 from Group C (6.3%), and 39 from Group D (24.4%) had a good quality of life [Table 6]. The chi-square analysis gave a $p = 0.000$ ($p < 0.05$), so it can be concluded that there is a proportional difference between Group A, Group B, Group C, and Group D [Table 6]. In other words, there is a significant relationship between the ABCD Groupings classification and quality of life.

Discussion

In this study, the average age of respondents was 61.79, or about 62 years old. This study was in line with Yoon et al., which looked at the prevalence of COPD in Korea, where 13.4% of the population was over 40 years old.[2] Aging increases the risk of COPD.[1] This occurs because lung function in old age decreases due to the reduced elasticity of lung tissue and a diminished chest wall. In old age, there is also a decrease in respiratory muscle contraction. The prevalence of COPD in men was greater than in female smokers (47.5% versus 1.1%).[8] A study of

Table 1 Patients characteristics ($n = 200$).

No	Patients' characteristic(s)	*n*	(%)
1	**Sex**		
	Male	135	67.5
	Female	65	32.5
2	**Education**		
	No education	11	5.5
	Elementary/Junior High	88	44.0
	School	65	32.5
	Senior High School	36	18.0
	University		
3	**Marital status**		
	Unmarried/Widowed/widowered	58	29%
	Married	142	71%
4	**BMI by sex**		
	Females		
	Underweight	9	13.8
	Normal	20	30.8
	Overweight	19	29.2
	Obesity	17	26.2
	Males		
	Underweight	30	22.2
	Normal	59	43.7
	Overweight	23	17.0
	Obesity	23	17.0
5	**Comorbidities**		
	None	89	44.5
	1 comorbidity	67	33.5
	>1 comorbidities	44	22.0
6	**Smoking habits**		
	Yes	113	56.5
	No	87	43.5
7	**Number of cigarettes**		
	consumed	48	42.5
	≥20 cigarettes per day	65	57.5
	<20 cigarettes per day		
8	**Types of cigarettes**		
	Filter	64	56.6
	Non-filter	49	43.4
9	**Exacerbation history**		
	Yes	66	33.0
	No	134	67.0
10	**Severity of dispneau**		
	Mild (Group A–B)	45	22.5
	Moderate to severe	155	77.5
	(Groups C–D)		

Table 2 Patients' age ($n = 200$).

Patients' characteristic(s)	Mean	SD	Min–Max	CI95%
Age	61.76	10.089	22–86	60.3–63.17

11,738 individuals found that the prevalence of COPD in men was 84.4%, which corresponded to the results of this study that showed that men were more likely to suffer from COPD.[9]

The results showed that the majority of COPD respondents were less educated (elementary and junior high school), namely 84 people (42%); the prevalence of COPD in individuals with low levels of education occurred because

Table 3 Family income and length of diagnosis ($n = 200$).

Variable	Median	Min-Max	CI95%
Family income	2,000,000	500,000–25,000,000	2,416,721–3,434,279
Length of diagnosis	12	3–276	20.50–30.63

the level of one's education affects their knowledge of the dangers of smoking to their health.[9]

The risk of developing COPD is inversely proportional to socioeconomic status. However, it is unclear whether this result was due to exposure to indoor and outdoor air pollutants, overcrowding, malnutrition, infection, or other factors related to low social and economic status.[1] Whereas according to COPD if it is associated with poverty, the prevalence is much greater in lower socio-economic groups. Factors associated with poverty include poor diet, humid housing, and more frequent infections[10]; this result is consistent with this study which found that, of the 220 respondents, the average income of COPD patients was IDR 2,000,000, which is below the DKI Jakarta Daily Minimum Wage of IDR 3,648,035.82.[11]

The results showed that the majority of respondents did not have comorbidities (83 people, 41.5%), 70 (35%) had one comorbid disease, and 47 (23/5%) had more than one comorbid disease. It can be concluded that the number of respondents with COPD who have more comorbidities is greater than those who do not have comorbidities. In patients with COPD, comorbidity has a high prevalence and at least one comorbidity in the COPD population is often reported to be more than 50%.[12] Comorbidities in patients with COPD include chronic diseases such as atherosclerosis, chronic heart failure, lung cancer, osteoporosis, depression, and others. There are several explanations for why comorbidity is common in patients with COPD, such as older age, physical activity, or shared risk factors (such as smoking or systemic inflammation).

The results showed that the majority of respondents had a smoking habit (115 people, 57.5%), which has become the main risk factor for COPD. Worldwide, the most common risk factor for COPD is smoking tobacco. Tobacco smokers are reported to correspond to 90% of all COPD.[13] A lot of evidence suggests that the prevalence of COPD worldwide has never been as high as 25–45% of smokers worldwide with other risk factors.[14] The number of COPD patients who smoke is caused by mucus hypersecretion and chronic airway obstruction. The more cigarettes a person smokes and the longer the time spent as a smoker lead to a greater risk of developing COPD.

The relationship analysis of the severity of symptoms using the ABCD Groupings classification and the quality of life shows that 35 respondents in Group A (21.9%) have a good quality of life, 76 respondents (47.5%) in Group B, 10 respondents (6.3%) in Group C, and 39 respondents (24.4%) in Group D. This result is not consistent with research conducted by Boland et al. (2014) in the Netherlands,[4] which identified patients in Group B, Group C, and Group D as having much worse quality of life than those in Group A. This study was corroborated by research conducted by[6] in Brazil, which identified that respondents in Group D had a good quality of life (49.3%), followed sequentially by Group B (41.8%), Group C (26.9%), and Group A (25.8%).

The differences in quality of life in Groups A, B, C, and D occur because the majority of respondents have mild exacerbations (Group A and most of Group B). Patients who experience severe exacerbations will have a decreased quality of life. Exacerbations will cause disruption in their ability to carry out activities and can reduce work productivity.[15] Because treatment and care for COPD patients are palliative, the main treatment interventions are aimed at improving the quality of life; the concept of quality of life, therefore, is a major factor in the context of COPD because it has an impact on the lives of patients.[16] The quality of life of patients with COPD is associated with some factors, such as disease symptoms,[17] psychological factors,[18] disease severity, exacerbations,[19] and the presence of comorbidities.[20,21]

The results of the chi-square obtained $p = 0.000$ ($p < 0.05$) demonstrates that there is a significant relationship between the ABCD Groupings classification and quality of life in this study and it is in accordance with research conducted in the Netherlands[4] with $p < 0.001$. This classification can be used in the application of non-pharmacological therapies in COPD patients. The treatment that can be given by a professional nurse includes pulmonary rehabilitation with physical activity to strengthen muscles, breathing exercises, and exercise tolerance in stable patients and self-management, such as education involving other health teams related to the disease, treatment, and the use of bronchodilator devices. Palliative care works with other health teams in reducing the patients' suffering, improving the quality of life, and facilitating the end of life care.[1]

The results of this study indicate there is a relationship between the severity of COPD, using the ABCD Grouping classification, and the quality of life of COPD patients. Based on this research, it is expected that nurses can apply comprehensive nursing care according to the symptoms and history of exacerbations.

The ABCD Groupings classification has a strong correlation with the patients' quality of life, so that it is hoped that using this classification can improve the quality of life of COPD patients and can provide nursing interventions in accordance with the Group classification.

Table 4 COPD severity classification by patients' characteristics ($n = 200$).

Patients' characteristics	A		B		C		D		
	n	%	*n*	%	*n*	%	*n*	%	
Sex									
a	Male	20	10.0	58	29.0	8	4.0	50	25.0
b	Female	15	7.5	37	18.5	2	1.0	10	5.0
Education									
	No education	0	0.0	5	2.5	0	0.0	7	3.5
	Elementary/Junior High School	13	6.5	36	18.0	27	13.5	27	13.5
	Senior High School	15	7.5	28	14.0	20	10.0	20	10.0
	University	7	3.5	26	13.0	6	3.0	6	3.0
Marital status									
	Unmarried/Widowed/widowered	8	4.0	27	13.5	2	1.0	19	9.5
	Married	27	13.5	68	34.0	8	4.0	41	20.5
BMI by sex									
	Females								
	UnderweightNormalOverweightObesity	1446	1.66.36.39.4	411 12 10	6.317.218.815.6	0110	0.01.61.60.0	3 4 2 1	4.7 6.3 3.1 1.6
	Males								
	UnderweightNormalOverweightObesity	11234	0.78.82.22.9	14201410	10.314.710.37.4	1511	0.73.70.70.7	172247	12.516.22.95.1
Comorbidities									
	No comorbidities	13	6.5	39	19.5	6	3.0	25	12.5
	1 comorbidity	12	6.0	34	17.0	3	1.5	21	10.5
	>1 comorbidities	10	5.0	22	11.0	1	0.5	14	7.0
Smoking habits									
	Yes	14	7.0	46	23.0	8	4.0	47	23.5
	No	21	10.5	49	24.5	2	1.0	13	6.5
Exacerbation history									
	Yes	35	17.5	95	47.5	0	0.0	0	0.0
	No	0	0.0	0	0.0	10	5.0	60	30.0
Severity of dispneau									
	Mild (Groups A–B)	35	17.5	95	47.5	10	5.0	0	0.0
	Moderate to severe (Groups C–D)	0	0.0	0	0.0	0	0.0	60	30.0

Table 5 COPD severity classification by patients' characteristics ($n = 200$).

Patients' characteristics	A		B		C		D	
	Mean	CI95%	Mean	CI95%	Mean	CI95%	Mean	CI95%
Age	58.9 (22–77)	54.7–63.08	61.44 (36–84)	59.57–63.31	63.3 (43–78)	55.5–71.02	63.50 (45–86)	61.35–66.18
Length of diagnosis	11 months (3–120)	10.11–26.35	12 months (3–216)	17.52–31.97	16.30 months (3–36)	7.59–25.01	17 months (3–276)	25.21–51.45
Family income	IDR 3 million (IDR 500,000–25 million)	IDR 2,158,514.04 –5,812,914.53	IDR 2,500,000 (IDR 500,000–25 million)	IDR 2,512,742.73 –4,209,362.53	IDR 2,450,000 (IDR 1 million–6 million)	IDR 1,338,571.80 –3,561,428.20	IDR 2 million (IDR 500,000–2 million)	IDR 1,597,307.11 –2,999,359.56

Table 6 Relationship between COPD severity classification and the quality of life ($n = 200$).

COPD severity classification	Quality of life				Total		*p*-Value
	Poor		Good				
	n	%	*n*	%	*n*	%	
A	0	0.0	35	21.9	35	100	0.000
B	19	20.0	76	47.5	95	100	
C	0	0.0	10	6.3	10	100	
D	21	35.0	39	24.4	60	100	

Conflict of interests

The authors declare no conflict of interest.

Acknowledgement

This work is supported by Hibah PITTA funded by DRPM Universitas Indonesia No. 1856/UN2.R3.1/HKP.05.00/2018.

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