

ORIGINAL ARTICLE

HEALTH-RELATED QUALITY OF LIFE AND SLEEP QUALITY AMONG COPD PATENTS IN MALAYSIA

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ABSTRACT

In Malaysia, chronic respiratory disease including COPD is responsible for 7% of the total Disability-Adjusted Life Years (DALYs). Sleep disturbance in COPD patients is often underestimated and overlooked clinically. Respiratory symptoms caused by COPD often leads to poor sleep quality and insomnia. Poor sleep quality contributes to frequent episodes of exacerbation which directly increases mortality risk. This study aims to determine health-related quality of life and sleep quality among COPD patients and their associations with severity. In this cross-sectional study, 102 COPD patients classified according to Global Initiative for Chronic Obstructive Lung Disease were evaluated. EQ5D and Pittsburgh Sleep Quality Index (PSQI) questionnaires were used to assess health-related quality of life and sleep quality respectively. Results showed the severity of COPD is significantly associated ($p < 0.05$) with all 5 dimensions of EQ5D among COPD patients in Kuala Lumpur. In this study, 71 patients (69.9%) were reported to be poor sleepers (PSQI > 5) with a mean global score of 6.93 ± 4.072 . Sleep quality was also found to be significantly associated ($p < 0.05$) with COPD severity, in which patients with lower severity showed better sleep quality. In this study, COPD severity was found to be significantly associated with health-related quality of life. As the disease severity progresses, both quality of life and sleep quality worsens gradually. Findings from this study highlight the importance to consider the quality of life and sleep quality as part of the management plan for COPD patients.

Keywords: Chronic Obstructive Pulmonary Disease, Health-related Quality of Life, Sleep Quality

INTRODUCTION

Chronic Obstructive Pulmonary Disease (COPD) is anticipated to be ranked as 3rd in terms of the most common cause of death by the year 2020 after ischemic heart disease and cerebrovascular accident¹. COPD is also the seventh most common cause of premature deaths in Malaysia in 2010 according to the Global Burden of Disease. Seven percent of Disability-Adjusted Life Years in Malaysia consists of chronic respiratory disease including COPD².

The prevalence of COPD in Malaysia is 4.7%, which is estimated by the COPD prevalence model that utilizes risk factors and epidemiological relationships to project the prevalence rate in a population aged 30 years old and above. COPD patients mostly experience symptoms that significantly affect their quality of life and sleep quality. Common symptoms in COPD patients such as cough, dyspnea, and production of sputum affect the quality of life based on the severity of disease³. Health-related quality of life in COPD patients can represent the measure of overall control of the disease. Compromised quality of life is even seen among patients with mild COPD and also keeping in mind that comorbid conditions also

affect the relationship between COPD and health-related quality of life⁴.

Quality of life in COPD impacts not only the patients themselves, but also on finances. In a study conducted in Sweden, the main indirect cost is the loss of productivity due to disability at which the study also stated 90% of the indirect costs or annual average costs were SEK 7,079 per person⁵. Sleep disturbance in COPD patients is often underestimated and overlooked clinically. Poor survival in COPD patients is strongly linked to sleep disturbance caused by the disease itself. Respiratory symptoms caused by COPD such as dyspnoea and nocturnal cough leads to poor sleep quality and insomnia⁶. Disturbance in sleep and poor sleep quality contributes to frequent episodes of exacerbation which directly increases mortality risk.

Most COPD patients have trouble initiating sleep, maintaining sleep, reduced REM sleep, micro-arousals and frequent sleep stage shifts which disturbs sleep efficiency⁷. Sleep quality and health-related quality of life are the two most important aspects that need to emphasize and explored among COPD patients. This study aims to determine health-related quality of life and sleep quality among COPD patients and to determine

the association between health-related quality of life and sleep quality among COPD patients.

METHODS

Declaration of Helsinki was used as ethical guidelines in this study and ethical approval was obtained from Medical Research and Ethics Committee. Patient Information Sheet was given and informed consent form was signed and dated by patient.

Patients' selection.

The number of patients calculated for this study was 102, taking into account of 0.05 type 1 error rate, power of, 0.8 and prevalence of COPD at 4.7%⁸. Patients were recruited using convenient sampling at COPD Specialist Clinic Institut Perubatan Respiratori, Hospital Kuala Lumpur, Malaysia from August 2018 to October 2018. Global Initiative for Chronic Obstructive Lung Disease (GOLD) standard was utilized as criteria to diagnose and stage COPD patients. To group participants according to GOLD Classification 2019, the Refined ABCD Assessment tool was used⁹. The latest FEV1 post-bronchodilator performed for each COPD patient was gathered from their respective case files. Inclusion criteria are Malaysians diagnosed with COPD. Exclusion criteria are patients with pulmonary tuberculosis, pregnancy, HIV positive, cancer, and emphysema. The nature and consequences of the study were explained and consent was obtained via an informed consent form from each participant.

Refined ABCD Assessment Tool

The Refined ABCD assessment tool uses two measures which include the frequency of exacerbations experienced in last year by patient and symptoms of COPD¹⁰. Firstly, the number of exacerbations experienced by a COPD patient in the previous 12 months is determined to classify the patient either into high risk of exacerbation or low risk of exacerbation. Secondly, patient's symptoms are assessed using modified Medical Research Council scale (mMRC) to classify the patient into either 'mMRC score 0-1' or 'mMRC score equals or, more than 2'. Based on these two measures, the patient will be categorised into Group A, B, C or D as below:

Group A: Low exacerbation risk, Low symptom severity (nil or one exacerbation in the previous year and mMRC score 0 - 1)

Group B: Low exacerbation risk, High symptom severity (nil or one exacerbation in the previous year but mMRC score equals or more than 2)

Group C: High exacerbation risk, Low symptom severity (> one or two exacerbations in the previous year and mMRC score 0 - 1)

Group D: High exacerbation risk, High symptom severity (> one or two exacerbations in the previous year and mMRC score equals or more than 2)

Sleep quality among COPD patients was assessed by using Pittsburgh Sleep Quality Questionnaire (PSQI)¹¹. Health-related quality of life was assessed using EQ-5D-3 L questionnaire¹².

Statistical Analysis

For categorical variables, Chi²-test was used to compare Sleep Quality and Health-related Quality of Life among COPD patients in GOLD classification, whereas for continuous variables, analysis of variance (ANOVA) was used. Association between sleep quality and HRQoL quantified by Spearman's rank coefficient. Statistics analyzed using SPSS software version 20.0. P-values of 0.05 or less are used to show statistical significance.

RESULTS

Socio-demographic factors of COPD patients

The total number of participants in this research from August 2018 until the end of October 2018 is 102 (Table I). The median age of participants is 67.5 (IQR 7) and the mean age of participants is 66.8. In terms of age category, the majority are from the age group of 51- 80 years ago, which accounts for 89.3% of the total participants in this study. The majority of participants (n=96 ,94.1%) are male compared to 6 (5.9%) female participants in this study. In terms of ethnicity, 51 (50.0 %) of the participants recruited are Malay and 28 (27.5%) Chinese and 23 (22.5%) consist Indian. About 24 (23.5%) are still active smokers. One participant has never smoked before and based on further history, it was clear that the current condition is due to occupational related. Smoking status was found to be statistically significant (p=0.002) among COPD patients in this study. Education levels were mostly secondary school (n=50, 49%). Regarding monthly incomes, 60 (58.8%) in the category of income ranging from rm1000- 4999.

Health-related Quality of Life (EQ5D-3L)

Based on this study, there is a significant association between Health-Related Quality of Life and COPD severity (p<0.01). In terms of mobility, 19 participants who have no problem in mobilizing are mostly from GOLD A (n = 13), and about 2 of them from GOLD B. Those participants (n= 83) who have problems in mobility are from all groups in GOLD classification. GOLD A which is mentioned to be low risk and low symptom burden, contributes about 25 participants (30.1%) who have problems in mobility. Pain shows a significant association among COPD patients in health-related quality of life. Based on the findings from this study, more participants from GOLD C and D are seen to experience pain comparative GOLD A and GOLD B, which affects

the quality of life. Anxiety or depression among COPD patients shows significant association ($p < 0.05$) with GOLD classification. Participants from GOLD D shows the highest percentage of COPD patients who have some degree of anxiety or depression. The 5 dimensions of EQ5D are summarized in general, regardless of COPD severity in the table below (Table II).

EQVAS portrays participants' health state at which 100 on the scale indicates health state at its best and 0 on the scale is health state at its worst. About 30 participants from GOLD D showed EQVAS 26 - 50, whereas 28 participants from GOLD A showed EQVAS 51 - 75 and 8 participants from GOLD A showed EQVAS 76 - 100. Based on this finding, participants ($n=36$, 94.7%) from the less severe COPD group (GOLD A) chose a better health state on the scale provided whereas, the majority of participants ($n=30$, 93.8%) from the most

severe form of COPD group (GOLD D) chose worse health state on the scale.

Sleep Quality

COPD severity was found to be significantly associated ($P < 0.05$) with all the PSQI parameters, which includes subjective sleep quality, sleep duration, sleep latency, daytime dysfunction, step disturbances, habitual sleep efficiency, and use of sleep medications (Table III). Participants from GOLD class A which is less severe show a higher tendency of better sleeping quality, with 25 patients reported to have good sleep, which scored less than 5 on the Global Score of PSQI (Table IV). The majority of participants from GOLD D which most severe in COPD severity found to be poor sleepers, with 32 reported to have poor sleep (scored 5 or more on Global Score of PSQI).

Table 1: Socio-demographic characteristics of the respondents (COPD patients)

Characteristic		Median	A	B	C	D	p value
Age (Median, IQR)		67.5		-			-
Age Group	30-40		1(50.0%)	0(0.0%)	1(50.0%)	0(0.0%)	p=0.039*
	41-50		0(0.0%)	0(0.0%)	3(75.0%)	1(25.0%)	
	51-60		3(14.3%)	2(9.5%)	9(42.9%)	7(33.3%)	
	61-70		16(50.0%)	0(0.0%)	7(21.9%)	9(28.1%)	
	71-80		14(36.8%)	3(7.9%)	6(15.8%)	15(39.5%)	
	>80		4(80.0%)	1(20.0%)	0(0.0%)	0(0.0%)	
Ethnicity	Malay		14(27.5%)	4(7.8%)	17(33.3%)	16(31.4%)	p=0.103
	Indian		12(52.2%)	2(8.7%)	5(21.7%)	4(14.7%)	
	Chinese		12(42.9%)	0(0.0%)	4(14.3%)	12(42.9%)	
Gender	Male		35(36.5%)	5(5.2%)	26(27.1%)	30(31.2%)	p=0.366
	Female		3(50.0%)	1(16.7%)	0(0.0%)	2(33.3%)	
Smoking status	Active Smoker		6(25.0%)	0(0.0%)	9(37.5%)	9(37.5%)	p=0.002*
	Ex-smoker		32(41.6%)	5(6.5%)	17(22.1%)	23(29.9%)	
	Never smoked before		0(0.0%)	1(100%)	0(0.0%)	0(0.0%)	
Education level	Primary school		7(25.0%)	3(10.7%)	7(25.0%)	11(39.3%)	p=0.487
	Secondary school		20(40.0%)	3(6.0%)	11(22.0%)	16(32.0%)	
	Diploma		8(44.4%)	0(0.0%)	5(27.8%)	5(27.8%)	
	Bachelor		3(50.0%)	0(0.0%)	3(50.0%)	0(0.0%)	
Monthly income	<rm1000		15(36.6%)	3(7.3%)	10(24.4%)	13(31.7%)	p=0.922
	rm1000-rm4999		22(36.7%)	3(5.0%)	16(26.7%)	19(31.7%)	
	rm5000-rm10000		1(100%)	0(0.0%)	0(0.0%)	0(0.0%)	

Table 2: EQ5D-3L dimension based on COPD GOLD Classification

EQ-D5		GOLD Classification				Total
		A	B	C	D	
MOBILITY ^a p value 0.002	No problem	13	2	4	0	19
	Problems	25	4	22	32	83
SELFCARE ^a p value 0.000	No problem	34	4	22	7	67
	Problems	4	2	4	25	32
USUAL ACTIVITY ^a p value 0.000	No problem	30	1	19	3	53
	Problems	8	5	7	29	40
PAIN ^a p value 0.001	No problem	37	4	22	19	82
	Problems	1	2	4	13	20
ANXIETY ^a p value 0.000	No problem	36	4	23	14	77
	Problems	2	2	3	1	25

^aAnalysis using Pearson Chi-square test (p<0.05)

Table 3: PSQI in association with GOLD classification

PITTSBURGH SLEEP QUALITY INDEX ^a	GOLD Classification				Total
	A	B	C	D	
POOR SLEEPERS	13	5	21	32	71
GOOD SLEEPERS	25	1	5	0	31
Total	38	6	26	32	102

^aAnalysis using Pearson Chi-square test (p<0.05)

Association between Health-related Quality of Life and Sleep Quality among COPD patients

This study showed that the association between EQ5D and PSQI was significant (Table V). Sleep quality was significantly associated (P<0.05) with mobility among patients, where most of the patients who had problems in mobility (79.5%) are poor sleepers. Sleep quality was also reported to be significantly associated (P<0.05) with self-care among patients. A percentage of 97.1% (n=34) participants who had problems in self-care are poor sleepers. On the other hand, 91.8% n=45 participants who had problems in their usual activities, such as work, family, or leisure activities were found to be poor sleepers. About 95.0% of participants who reported some degree of pain or discomfort are poor sleepers, this showed sleep quality was significantly associated (p < 0.05) with pain or discomfort among COPD patients. Besides that, 96.0% of participants who showed some degree of anxiety were poor sleepers. Sleep quality was significantly associated (p-value < 0.05) with anxiety or depression among COPD patients. In a nutshell, health-related quality of life (EQ5D) and sleep quality (PSQI) among COPD patients showed significant

association with each other (P<0.05).

Correlation of Health-related Quality of Life with Disease severity and sleep quality

Apart from the above analysis, the correlation of Health-related Quality of Life (EQ5D) with GOLD classification and Sleep Quality (PSQI) was analyzed using Spearman’s correlation (Table VI). In this analysis, EQ5D self-care domain was reported having a moderate positive correlation with GOLD (r² = 0.561) and PSQI (r² = 0.618) which were statistically significant (p<0.05). Similar findings were reported with the EQ5D usual activities domain at which it showed a moderate positive correlation with GOLD (r² = 0.568) and PSQI (r² = 0.582). Apart from that, findings showed a weak positive correlation between the EQ5D pain domain with GOLD (r² = 0.385) and PSQI (r² = 0.377), which was statistically significant (P<0.05).

EQ5D anxiety domain showed weak positive with GOLD (r²=0.46) and moderate positive correlation with PSQI (r²=0.538). Other EQ5D domains (mobility and pain) were reported having a weak correlation with GOLD and PSQI, at which r² strength of correlation range from 0.335 to 0.46

Table 4: Association of PSQI scores with COPD severity

PSQI SCORES	Gold Classification				p value	
	A	B	C	D		
Subjective Sleep Quality	0	14(77.8%)	0(0.0%)	4(22.2%)	0(0.0%)	p=0.000*
	1	23(44.0%)	4(7.7%)	19(36.5%)	6(11.5%)	
	2	1(3.6%)	2(7.1%)	3(10.7%)	22(78.6%)	
	3	0(0.0%)	0(0.0%)	0(0.0%)	4(100.0%)	
Sleep Duration	0	22(48.9%)	2(4.4%)	14(31.1%)	7(15.6%)	p=0.001*
	1	10(45.5%)	3(13.6%)	5(22.7%)	4(18.2%)	
	2	6(26.1%)	1(4.3%)	5(21.0%)	11(47.8%)	
	3	0(0.0%)	0(0.0%)	2(16.7%)	10(83.3%)	
Sleep Latency	0	18(69.2%)	0(0.0%)	6(23.1%)	2(7.7%)	p=0.000*
	1	14(42.8%)	2(6.3%)	12(37.5%)	4(12.5%)	
	2	5(29.4%)	3(17.6%)	4(23.5%)	5(29.4%)	
	3	1(3.7%)	1(3.7%)	4(14.8%)	21(77.8%)	
Daytime Dysfunction	0	18(56.3%)	1(3.1%)	10(31.3%)	3(9.4%)	p=0.000*
	1	18(41.9%)	3(7.0%)	15(34.9%)	7(16.3%)	
	2	2(7.4%)	2(7.4%)	1(3.7%)	22(81.5%)	
	3	0(0.0%)	0(0.0%)	0(0.0%)	0(0.0%)	
Step Disturbance	0	0(0.0%)	0(0.0%)	2(100.0%)	0(0.0%)	p=0.009*
	1	34(43.0%)	5(6.3%)	21(26.6%)	19(24.1%)	
	2	4(19.0%)	1(4.8%)	3(14.3%)	13(61.9%)	
	3	0(0.0%)	0(0.0%)	0(0.0%)	0(0.0%)	
Habitual Sleep Efficiency	0	35(87.5%)	4(10.0%)	1(2.5%)	0(0.0%)	p=0.000*
	1	3(11.1%)	2(7.4%)	17(63.0%)	5(18.5%)	
	2	0(0.0%)	0(0.0%)	7(26.9%)	19(73.1%)	
	3	0(0.0%)	0(0.0%)	1(11.1%)	8(88.9%)	
Use of Sleeping Medications	0	37(39.8%)	5(5.4%)	25(26.9%)	26(28.0%)	p=0.004*
	1	1(14.3%)	0(0.0%)	1(14.3%)	5(71.4%)	
	2	0(0.0%)	0(0.0%)	0(0.0%)	1(100.0%)	
	3	0(0.0%)	1(100.0%)	0(0.0%)	0(0.0%)	

Table 5: Summary of Association between EQ5D and PSQI

EQ5D DIMENSION		POOR SEELPERS	GOOD SLEEPERS	Total	p value
MOBILITY	No problem	8(42.1%)	11(57.9%)	19	0.006*
	Problems	63(75.9%)	20(24.1%)	83	
SELFCARE	No problem	37(55.2%)	30(44.8%)	67	0.000*
	Problems	34(97.1%)	1(2.9%)	35	
USUAL ACTIVITIES	No problem	26(49.1%)	27(50.9%)	53	0.000*
	Problems	45(91.8%)	4(8.2%)	49	
PAIN/DISCOMFORT	No problem	52(63.4%)	30(36.6%)	82	0.006*
	Problems	19(95.0%)	1(5.0%)	20	
ANXIETY	No problem	47(61.0%)	30(39.0%)	77	0.001*
	Problems	24(96.0%)	1(4.0%)	25	

Table 6: Correlation of EQ5D with GOLD classification and PSQI

EQ5D ^b	GOLD r^2	p value	PSQI r^2	p value
Mobility	0.385	0.002	0.337	0.006
Selfcare	0.561	0.000	0.618	0.000
Usual activity	0.568	0.000	0.582	0.000
Pain	0.377	0.001	0.335	0.006
Anxiety	0.46	0.000	0.538	0.001

^bAnalysis using Spearman's correlation.

DISCUSSION

Socio-demographic profile of COPD patients

The median age of participants in this study was 67.5 (7 IQR) with males being the predominant gender. The most common age group in the study reported to be COPD patients are those from 51- 80 years of age and the majority of them were males. In a study conducted in Taiwan, elderly patients were the most common, and the male gender was 98%¹³. It is perceived that patients usually present after the development of chronic disease progression which explains the predominantly older age group among COPD patients¹⁴. This is probably may be due to a lack of awareness among patients regarding recognition of early symptoms of COPD. Approximately similar findings were seen in a study in which the majority of the participants in that study were males 127 (90.7%) and most 87 (62.14%) of them were between the age group of 61-86 years¹⁵. Besides that, also reported that the Malays (55.9%) were highest in terms of the prevalence of smoking, and the age category of 21-30 years (59.3%) reported highest in the prevalence of smoking¹⁶. In this study, 75.5% of the participants were ex-smokers and 23.5% were active smokers, implies the majority of smokers and ex-smokers are associated with COPD, which was statistically significant ($p=0.002$).

Health-related Quality of Life in COPD patients

COPD severity is significantly associated ($p<0.05$) with all 5 dimensions of EQ5D which includes mobility, self-care, usual activities, pain or discomfort, and anxiety among COPD patients. The progression of the disease causes functional ability deterioration which may lead to emotional issues such as anxiety. This can be seen in this study in which most activities involving functional ability such as mobility, self-care, and usual activities are reported to have the majority number of participants from GOLD C and GOLD D (the severe form of COPD severity). In a study conducted in Italy, the frequency of symptoms increased significantly with the severity of COPD¹⁷. Besides functional abilities, emotional

issues such as anxiety or depression also reported being increasing in number as disease severity worsening from GOLD A to GOLD D. Probably COPD patients may face or experience emotional changes such as anxiety as they realize their functional abilities worsen as the disease progresses⁶. In this study also, pain or discomfort in EQ5D reported to increase as disease severity progression from GOLD A to GOLD D. Pain or discomfort in COPD patients can be due to pathophysiological changes that happen when COPD disease progresses and also can due to worsening functional abilities. In a study conducted at West Park Healthcare Centre, it was found that in the severe to very severe COPD group, the presence of pain was noticed among stable participants¹⁸. According to another study, with increasing severity of the disease, health-related quality of life in COPD patients deteriorates and also stated that this deterioration is linearly related with predicted values of Forced Expiratory Volume of 1 sec (FEV_1)¹⁹. In another study, both EQ-5D utility score and EQ-5D Visual Analogue Scale declined significantly between moderate and severe COPD²⁰. A cross-sectional analysis conducted in German reported a worsening mean score of SGRQ, CAT, and EQ5D with higher COPD grades²¹.

Sleep Quality among COPD patients

Many studies reported nighttime symptoms and poor sleep quality are seen more often among COPD patients. Poor sleep quality among COPD patients is also majorly contributed by factors such as obstructive sleep apnoea, psychiatric disorder and medication-related insomnia²². In this study, participants ($n=71$, 70.0%) had mean PSQI scores of 6.93 ± 4.072 . Similar reports were also noted in studies conducted in Israel, Iran and Taiwan with theme scores of 11.0 ± 5.4 , 8.03 ± 3.66 and 9.41 ± 4.33 respectively²³⁻²⁵. In this study, findings suggestive of worsening sleep quality as COPD disease severity progresses. Similar findings are seen in a study conducted by Lewis and co-workers (2008) which states 61% had poor quality sleep ($PSQI>5$) are from moderate to severe COPD group which had 59 patients²⁶. Many studies showed that

poor sleep quality causes many negative effects to individuals such as being fatigued, anxiety or changes in cognitive functions^{27,28}.

Health-related Quality of Life and Sleep Quality among COPD patients

From this study, the association of all 5 dimensions of EQ5D (Mobility, Self-care, Usual Activities, Pain or Discomfort, Anxiety) with sleep quality (which categorized based Global Score of PSQI) was found to be statistically significant ($p < 0.05$). Most participants ($n = 66$, 75.9%) who had problems in mobility were poor sleepers. About 97.1% of participants who had problems in self-care are poor sleepers. Parallel findings noted in the study assessed self-disturbance and implication of self-care in failure which showed disturbed sleep is associated with symptoms and functional deficits²⁹. Usual activities were found to be significantly ($P < 0.05$) associated with sleep quality, where 91.8% of participants who had problems in their usual activities are poor sleepers. About 95.0% of participants who reported some degree of pain or discomfort are poor sleepers. Pain among COPD patients varies. In a cross-sectional study carried out with data collected from the European Health Interview Surveys for Spain (EHSS) conducted in years 2009/2010, the prevalence of chronic neck pain, chronic lower back pain, and migraine were significantly higher among COPD patients in comparison with controls³⁰. Many factors, including pain, disease process, and medication used to control the disease may disturb sleep. The natural course of painful disease can be adversely affected by sleep disturbance. This vicious circle can be controlled among a group of patients who suffer from the painful disorder in term of improving sleep quantity and quality³¹. Besides that, 96.0% of participants who showed some degree of anxiety are poor sleepers ($p < 0.05$). Impaired health positively associated with anxiety. In a prospective study, the scores of SGRQ for patients with acute exacerbation of COPD admitted in 5 university hospitals in the Nordic countries, were up to 12 units after COPD discharged from hospital. This is considered 3 times clinically significant³².

Correlation of Health-related Quality of Life with disease severity and sleep quality.

Health-related Quality of Life (EQ5D) was significantly associated with GOLD and PSQI ($p < 0.05$). By analysis using Spearman's correlation, each domain of EQ5D was reported to have a positive correlation with disease severity (GOLD) and sleep quality (PSQI). Varied strength of correlations seen upon analyzing each domain of EQ5D. Both self-care domain and usual activities domain of EQ5D showed a moderate positive correlation with disease GOLD and PSQI. These findings probably due to the nature and progress of COPD condition, disease progression affects the ability to do usual activities and self-care routine such studying, housework, spending leisure time with family, dressing and cleaning own self. Similar finding noted in another study,

quality of life is compromised quality of life seen in COPD which worsens as the disease progresses⁸. Nonetheless, due to smaller sample size in this study, all the correlations being established were of weak or moderate strength. Future study with bigger sample should be able to establish a stronger correlation relationship.

CONCLUSION

This study identified that COPD patients have their quality of life and sleep quality significant association with disease severity. Sleep quality and health-related quality of life worsen gradually as the disease severity progresses. Sleep quality of an individual who suffers from COPD also affects health-related quality of life. Findings from this study may assist to manage COPD patient more accurately since we know that pharmacological treatment is not comprehensive enough to manage COPD patients. Quality of life and sleep quality should be considered when it comes to the management plan for COPD patients.

Conflict of interest

The authors declare no potential conflict of interest.

Acknowledgement

I would also like to show our gratitude to Ministry of Health Malaysia for allowing me to take my samples from Institut Perubatan Respiratori, Kuala Lumpur.

Funding

This work was supported by Ministry of Education, under the funding of Fundamental Research Grant Scheme [FRGS/2/2014/SKK10/UCSI/03/1].

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