

## Assessment Lifestyle for Patients with Chronic Obstructive Pulmonary Disease

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### Abstract

**Background:** Lifestyle of Chronic obstructive pulmonary disease (COPD) is crucial to improve patients' health status, reduces hospital admissions and slow the progression of the disease. Nurses have an important role in promoting the lifestyle of COPD patients as providing the education to change and modify lifestyle. **Aim:** This study aimed to assess level of knowledge and lifestyle of patients with (COPD). **Design:** A descriptive design was conducted to achieve aim of this study. **Setting:** the study was carried out in chest diseases department of Beni-Sueif University hospital. **Subjects:** A Purposive sample of 50 patients admitted in the previous mentioned setting. **Tools:** I-Interview questionnaire sheet which composed of demographic characteristics, patient's knowledge regarding (COPD)- II-Miller-Smith lifestyle questionnaire to assess the lifestyle of (COPD) patients. **Results:** revealed that, more than three fifth of the studied patients were smokers. The majority of studied patients had low knowledge level. Eating habit, physical activity, motivation and state of mind, adherence to medication regimen and smoking habits had low adequacy level that indicate low level of lifestyle. **Conclusion:** There were highly statistically significant relation between lifestyle and age, gender, marital status and level of education. **Recommendations:** Further researches are recommended to continuing health education program should be given for COPD patients to improve their quality of life.

**Keywords:** Lifestyle, Chronic Obstructive Pulmonary Disease.

### Introduction

Chronic Obstructive Pulmonary Disease (COPD), represents an important public health challenge and is a major cause of chronic morbidity and mortality throughout the world. COPD is an umbrella term used to describe progressive lung disease including emphysema, chronic bronchitis and refractory (None reversible) asthma. The COPD burden is projected to increase incoming decades because of continued exposure to COPD risk factors and aging

of the population. However COPD progressive and incurable disease, but with right diagnosis and treatment people can live for many years with COPD and enjoy life (*Panos & Eschenbacher, 2015*).

COPD caused at most by exposure to inhaled irritants, especially cigarette smoking, while other etiologies' include air pollutants, occupational dusts and fumes, chronic asthma and genetic predisposition (alpha1-antitrypsin deficiency). COPD is an important cause of morbidity and mortality. It already is

the third commonest cause of death worldwide. It is also portend to become the fifth commonest cause of chronic disability, largely because of the increasing levels of cigarette smoking in developing countries in conjugation with an ageing population (*Garrity & Vigneswaran, 2016*).

The common complications that may be occur in COPD; Hypoxemia with nocturnal desaturation, secondary erythrocytosis may occur due to chronically low po<sub>2</sub>, acidosis, respiratory infection risk increases because increased mucus and poor gas exchange, dysrhythmia, heart failure especially cor-pulmonale, osteoporosis, depression, anxiety, fatigue, Pneumothorax, or collapsed lung, lung cancer, gastro-esophageal reflux (GERD) also known as acid reflux, osteoporosis (thin, weak bones) or osteopenia (low bone density to a lesser degree than osteoporosis)and Malnutrition (*Matzo & Sherman, 2018*).

In Egypt, COPD is a rising significant health problem; however, information on its prevalence, morbidity, and mortality in Egypt is still lacking. The prevalence of COPD among high-risk individuals in Egypt was estimated to be about 10%. The main predictors for COPD diagnosis in Egypt are old age, smoking history, and presence of chest wheezes (*Said, Ewis, Omran, Magdy & Saleeb, 2015*).

### **Aim of the study**

This study aimed to assess level of knowledge and lifestyle of patients with chronic obstructive pulmonary disease.

### **Research question:**

What are the lifestyle of patients with chronic obstructive pulmonary disease?

### **Subject And Methods**

The subject and methods for the current study were portrayed under the four main designs as the following:

- I. Technical design.
- II. Operational design.
- III. Administrative design.
- IV. Statistical design.

#### **Technical design:**

The technical design included research design, setting, subjects and tools of data collection used in this study.

#### **Research design:**

A descriptive exploratory design was conducted to achieve aim of this study.

#### **Setting:**

This study was conducted in department of chest diseases which consists of 16 beds and chest outpatient clinic at Beni-Sueif university hospital.

#### **Subjects:**

- Purposive sample of 50 patients admitted to the previously mentioned setting.
- The sample was selected based on statistical power analysis test (the confidence level of 90% and margin of error of 5%).

#### **Tools of data collection:**

Three tools were used to collect necessary data to fulfill the study aim.

This tool was developed by the researcher after reviewing the related literature (*Decramer, Vogelmeier,*

*Bourbeau, Anzueto, Decramer, et al. (2016)* to assess patient status. It included 2 parts:

**Part (I):- Socio-demographic characteristic questionnaire:**

It was used to assess demographic characteristic of the studied patients (age, gender, level of education, occupation, past and present medical history).

**Part (II): Patient level knowledge Interview questionnaire:**

It was used to assess level of patients' knowledge about COPD. It included (Definition, disease occurrence, predisposing factors, signs and symptoms, diagnostic investigation, factors affecting on disease progression, prevention, treatment and complications).

**Tool (2):- Miller-Smith lifestyle questionnaire**

- This tool was adopted from (*Miller Smith, 1988*). It was used to assess lifestyle of COPD patients include exercise, sleeping, Spirituality, social relations, the general health, weight, nutrition, smoking and affection.

**• Scoring system:**

The Miller Smith lifestyle questionnaire included 20 items, responses were measured on a three-point Likert scale and polarized in (1 = always), 2= sometimes agree, 3= almost never). Scores of the statement of each component were summed-up, converted into percent score, and the total divided by the number of the items, giving a mean score for each component. The respondent life style considered Excellent/healthy if the total percent score was less than 50%, very good/moderate

50% - 70 %, good/Mild 70% - 95%, and unhealthy/poor if the score was > 95%.

**Content validity and reliability**

**Content validity** (refers to how well a scientific test actually measures what it is intended to measure) of the proposed tools was done using face and content validity. Face validity aimed at inspecting the items to determine whether the tools measure what supposed to measure. Content validity was conducted to determine whether the content of the tools cover the aim of the study. Validity tested through by a jury of 7 experts, one of them was a professor, three assistant professors and three lecturer of medical surgical nursing department at faculty of nursing, Ain Shams University. The tools reviewed for clarity, relevance, comprehensiveness, simplicity and applicability, minor modification was done. **Testing reliability** (refers to the extent to which the same answers can be obtained using the same instruments more than one time). Reliability of the developed tools was tested using alpha Cronbach model which is a model of internal consistence. The result of patients' knowledge questionnaire was .748, Miller-Smith lifestyle questionnaire was .698, lifestyle questionnaire was .783.

**Pilot study:-**

A pilot study was conducted to test feasibility and applicability of the study tools used in this study. It was carried out on 10% of patients (5 patients) with chronic illness in the previous mentioned setting. No modifications were done

**Field work:**

Data were collected in 6 months, from beginning of January 2018 to the end of Jun 2018. Data were collected by the researcher three days per week, at morning and afternoon shifts in the previous mentioned setting as the following:

- Assessment of patient socio-demographic data, past and present medical history, diagnostic investigations (Patient file) took about 20 minutes.
- Assessment of level of knowledge for each patient took about 20-30 minutes for each study patient.
- Assessment of lifestyle by using miller smith for each patient wastook about 20-30 minutes for each patient.

**Administrative design:**

An official letter was issued from the Faculty of Nursing Ain-Shams University to the director of Beni- Suef university Hospital and Director of General, Internal medicine and chest ICU units, at which the study was conducted, explaining the purpose of the study and requesting the permission for data collection from the study group.

**Statistical design:**

All Data were collected, tabulated and subjected to statistical analysis,

which is performed by SPSS in general (version 17). While Microsoft office Excel is used for data handling and graphical presentation. The statistical analysis included; number (No.), percentage (%), the arithmetic mean ( $\bar{X}$ ), standard deviation (SD) and chi-square ( $\chi^2$ ).

The observed differences and associations were considered as follows:

- $P > 0.05$  insignificant difference (No difference).
- $P \leq 0.05$  significant difference
- $P \leq 0.001$  highly significant difference
- Standard Deviation (SD) and arithmetic mean ( $\bar{X}$ ) were used for quantitative data.
- Frequency (number and percentage) were used for Qualitative categorical variables.

## Results

**Table (1):** Frequency and percentage distribution of study patients regarding demographic characteristics (n=50).

Items	No.	%
<b>Age</b>		
- 40≤50 years	11	22
- 50≤60 years	14	28
- >60 years	25	50
o Mean ± SD	52 ± 9.12	
<b>Gender</b>		
- Male	35	70
- Female	15	30
<b>Marital status</b>		
- Married	40	80
- Widowed	10	20
<b>Level of education</b>		
- Illiterate	35	70
- Inter mediated	12	24
- Bachelor	3	6
<b>Occupation</b>		
- Employee	10	20
- Free business	27	54
- House wife	13	26
<b>Income (monthly)</b>		
- Adequate for medication cost	50	100
- Inadequate for medication cost	0	0
<b>Residence</b>		
- Rural	43	86
- Urban	7	14
<b>No. of rooms</b>		
- Two rooms	4	8
- More than two	46	92
<b>Presence of pollution</b>		
- Yes	14	28
- No	36	72
o <b>Types of pollution (n=14)</b>		
-Pollution from factories	2	14.3
-Pollution from car gazes	12	85.7
<b>Exposure to sun shines</b>		
- Yes	50	100
- No	0	0
<b>Good ventilation</b>		
- Yes	50	100
- No	0	0
<b>Availability of water and sanitation</b>		
- Yes	43	86
- No	7	14

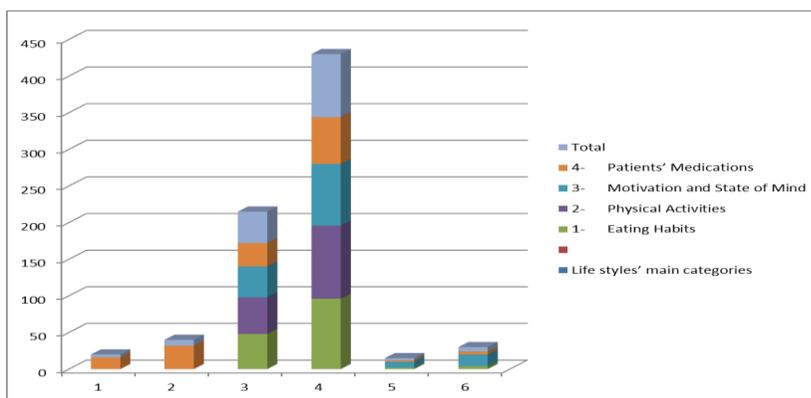
**Table (2):** Frequency and percentage distribution of study patients' knowledge regarding their current life style (n = 50).

Items	Satisfactory		Unsatisfactory	
	No.	%	No.	%
Definition	12	24	38	76
Disease occurrence	17	34	33	66
Predisposing factors	15	30	35	70
Signs and symptoms	29	58	21	42
Diagnostic investigations	21	42	29	58
Factors affecting on disease progression	17	34	33	66
prevention	8	16	42	84
Treatment	18	36	32	64
Complications	16	32	34	68

**Table (3):** Frequency and distribution of studied patients' life style regarding miller smith(n = 50).

Items	Always		Sometimes		Never	
	N	%	N	%	N	%
Smoke less than half a pack of cigarettes a day (non-smokers score 1)	20	40	14	28	16	32
Having a good health (including eyesight, hearing, teeth)	19	38	0	0	31	62
Having the appropriate weight for my height	15	30	0	0	35	70
Exercise to the point of perspiration at least twice a week	1	2	2	4	47	94
Eat at least one hot, balanced meal a day	19	58	9	18	12	24
Drink fewer than three cups of coffee (or tea or coke) a day	12	24	10	20	28	56
Get seven to eight hours sleep at least four nights a week	8	16	17	34	25	50
Regularly attend club or social activities	1	2	4	8	45	90
Do something for fun at least once a week	4	8	16	32	30	60
Give and receive affection regularly	49	98	1	2	0	0
Have a network of friends and acquaintances	45	90	2	4	3	6
Have at least one relative within 50 km on whom can rely	45	90	5	10	0	0
Have one or more friends to confide in about personal issues	14	28	36	72	0	0
Have regular conversations with the people live with about domestic problems e.g. chores, money and daily living issues	35	70	6	12	9	18
Able to speak openly about the feelings when angry or concerned	36	72	12	24	2	4
Getting strength from the religious beliefs, or feel comfortable with the view of the universe and my place in it	50	100	0	0	0	0
Take quiet time for self during the day	13	26	15	30	22	44
Able to organize the time effectively	7	14	10	20	33	66
Have an income adequate to meet the basic expenses	50	100	0	0	0	0

**Figure (1):** Frequency and distribution of studied patients' for total parts of life style(n = 50).



**Table (4):**Relation between studied patients' level of knowledge regarding their demographic characteristics (n = 50).

Demographic Characteristics	COPD Patients		Test $\chi^2$	P value
	No.	%		
<b>Age</b>				
40≤50 years	11	22.0%	3.57	.002*
50≤60 years	14	28.0%		
>60 years	25	50.0%		
<b>Gender</b>				
Male	35	70.0%	10.74	.000**
Female	15	30.0%		
<b>Marital status</b>				
Married	40	80.0%	7.01	.000**
widowed	10	20.0%		
<b>Level of education</b>				
Illiterate	35	70.0%	10.36	.000**
Inter mediated	12	24.0%		
Bachelor	3	6.0%		
<b>Occupation</b>				
Employee	10	20.0%	2,11	.000**
Free business	27	54.0%		
House wife	13	26.0%		

\*\*HS (Highly Significant) \*P value < 0.01S (No Significant)P value < 0.05

**Table (5):**Relation between studied patients' life style using Miller Smith tool according to their demographic characteristics (n=50).

Demographic Characteristics	COPD Patients		Test $\chi^2$	P value
	No.	%		
<b>Age</b>				
40≤50 years	11	22.0%	3.57	.002*
50≤60 years	14	28.0%		
>60 years	25	50.0%		
<b>Gender</b>				
Male	35	70.0%	10.7	.000*
Female	15	30.0%		
<b>Marital status</b>				
Married	40	80.0%	7.01	.000*
widowed	10	20.0%		
<b>Level of education</b>				
Illiterate	35	70.0%	10.3	.000*
Inter mediated	12	24.0%		
Bachelor	3	6.0%		
<b>Occupation</b>				
Employee	10	20.0%	2,11	.000*
Free business	27	54.0%		
House wife	13	26.0%		

\*\*HS (Highly Significant) \* P value < 0.01 S (No Significant) P value < 0.05

## Results

**Table (1)** showed that, 50% of studied patients there age more than 60 years old with Mean  $\pm$  SD  $52 \pm 9.12$ , 70% of them were male, 80% of studied patients were married, 70% of them illiterate, 54% of studied patients had free business, 100% of studied patients had adequate income for medication cost. 86% of studied patients' were from rural, 92% of studied patients had more than two rooms. While, 28% of studied patients had pollution, 85% of studied patients had car gaze pollution, 100% of studied patients had sun shine exposure, 100% of studied patients had good ventilation and 86% of studied patients had water and sanitation availability.

**Table (2)** revealed that, 58% satisfactory level of knowledge of studied patients regarding to signs and symptoms of the disease. While, 84% unsatisfactory

level of knowledge regarding to disease prevention.

**Table (3)** showed that, 100% of the studied patients always getting strength from the religious beliefs, or feel comfortable with the view of the universe and my place in it and had an income adequate to meet the basic expenses, 72% of studied patients sometimes had one or more friends to confide in about personal issues and 94% of studied patients never exercise to the point of perspiration at least twice a week.

**Figure (1)** showed that, 32% of studied patients were responses always regarding patients' medications, 100% of studied patients were responses often regarding physical activity and 16% of studied patients were responses never regarding motivation and state of mind.

**Table (4)** showed that, there were statistically significant differences

between patients' knowledge and their age. While, there were highly statistically significant differences between patients'

### **Discussion**

Learning to live well with chronic obstructive pulmonary disease is possible. Coping with chronic obstructive pulmonary disease involves skills training, learning to manage a number of symptoms, and consciously assessing and making lifestyle changes to make life more healthy and prevent the exacerbation of the disease (*Australian Lung Foundation, 2012*).

So, the aim of the current study was to assess lifestyle for patients with chronic obstructive pulmonary disease. To fulfill this aim one research question was stated: What are the lifestyle of patients with chronic obstructive pulmonary disease?

**In relation to demographic characteristics**, the results of the present study showed that, a half of studied patients were more than 60 years, this might be due to the high average age in the society, differences in culture, geography and constant exposure for environment pollution for years. This finding was in agreement with *Mitsiki, Bania, Varounis, Gourgoulianis & Alexopoulos (2015)* mentioned that, most of studied patients their age more than 60 years.

**Regarding to gender and marital status**, the present study showed that, most of studied patients were male and married. This might be due to smoking is widespread among men more than females. These finding was in agreement with *Balcells, Gea, Ferrer, Serra, Orozco-Levi & battle (2010)* who mentioned that, the majority of the studied patients was male and slightly

knowledge and gender, marital status, level of education and occupation.

more than half of studied patients were married.

This finding was disagreed with *Cedano, Belasco, Traldi, Machado & Bettencourt, (2012)* who found that, more than half of studied patients were female and widowed.

**Concerning the educational level**, the present study results indicated that, more two third of the studied patients was illiterate. This finding was in the same line with *Gallefoss, (2004)* who found that, more than half of studied patients were illiterate.

Also, this finding was in agreement with *Yin, Zhang, Li, Jiang & Zhao (2011)* who found that, most of studied patients were low educational level.

**Concerning smoking habits**, the present study showed that, the majority of the studied patients had smokers for more than ten years. This findings agreed with *Lapperre, Postma, Gosman, Snoeck-Stroband, Hacken, Hiemstra, Timens, Sterk and Mauad, (2006)* who found that, more than one third of studied patients smoking cigarette for more than ten years.

**Concerning patients' knowledge regarding chronic obstructive pulmonary disease**, the results of the present study showed that, the studied patients had total unsatisfactory level of knowledge regarding chronic obstructive pulmonary disease. This might be due to that the patients had low education level and lack of health awareness in the community.

This finding was in agreement with *Wong & Yu, (2016)* who presented

that, the majority of study patients impairment in the level of Chronic obstructive pulmonary disease patient's knowledge.

**Concerning patients' lifestyle according to miller smith**, the findings of the present study revealed that, the majority of studied patients had poor lifestyle level that may be due to nature of life, level of culture and education. This finding was agreed with **Hernandez, Balter, Bourbeau & Hodder, (2009)** who revealed that, more than three quarters of studied patients had bad lifestyle.

Regarding the relation between chronic obstructive pulmonary disease patients' for total parts of life style. The current study found that, there were bad life style for studied patients regarding to eating habits', physical activities, motivation and state of mind and patients' medications. In my opinion that may be due to low education level, level of knowledge and social level.

**Concerning the relation between the studied patients' level of knowledge**, the current study revealed that, there were statistically significant relation between patients' knowledge and age. In my opinion that me, this may be due to that, most of studied patients old age and had low educational level. Also, the current study found that, there are highly statistically significant relation between patients' knowledge, gender, marital status, level of education and occupation.

This findings came in accordance with **Nakken, Janssen, Bogaart, Muris, Vercoulen, Custers, Bootsma, Gronenschild, Wouters & Spruit, (2016)** who mentioned that there are statistically significant relation between

patients' knowledge, gender, level of education and occupation.

**Regarding the relation between Chronic obstructive pulmonary disease patients' life style using Miller Smith tool according to their demographic characteristics**, the current study revealed that, there were highly statistically significant relations between patients' lifestyle using Miller Smith and age, gender, marital status and level of education. This findings were in agreement with **Martin, (2008)** who founded that, there were highly statistically significant relations between patients' lifestyle and age and educational level.

## Conclusion

The present study showed that a half of the studied patients there age >60 years. A majority of studied patients smoke cigarettes. Near to total of studied patient had low level of knowledge about the disease. Finally, there were no statistically significant relations between patients' lifestyle and occupation.

More than three quarters of the studied patients had poor lifestyle level. The relationship between knowledge of studied patients and their life style regarding eating habits, there is a highly statistically significant relationship between patients' knowledge and lifestyle was found. Finally, there was a statistically significance relationship between knowledge & physical activity of studied patients.

## Recommendations

**In the light of these findings the following recommended was:**

**Recommendations for patient related factors:**

- Increase public awareness about efficacy and tolerability of the vaccination and modification of lifestyle in preventing COPD through directed program to persons in community.
- Health education through mass media concerning how to deal with exacerbation of the disease.
- Health education program about disease and its treatment modalities should be provided for chronic obstructive pulmonary disease patients to improve their lifestyle.
- Developing a simplified illustrated and comprehensive Arabic booklet including information about chronic obstructive pulmonary disease, lifestyle changes for coping with this disease and its therapeutic regimen.
- The importance of providing patients and their families with adequate knowledge about therapeutic regimen include exercise, diet, smoking cessation, follow up schedules and stress management to enhance their adherence to the therapeutic regimen.

#### **Recommendations for health care givers:**

- Continuous assessment of patients with respiratory symptoms and have one or more of chronic obstructive pulmonary risk factors for early detection of the disease and prevention disease exacerbation.

#### **Recommendations for further studies:**

- Replication of the study on longer sample to be able to generalize the result study.
- Further studies is recommended to evaluate the effect of lifestyle changes on progression of chronic obstructive pulmonary disease.

#### **References**

- Australian Lung Foundation, (2012): Better living with chronic obstructive pulmonary disease 2<sup>nd</sup> ed. Australia, The State of Queensland (Queensland Health) and The Australian Lung Foundation, P:15.
- Balcells, E., Gea, J., Ferrer, J., Serra, I., Orozco-Levi, M., Batlle, J. D., Study Group, P, (2010): Factors affecting the relationship between psychological status and quality of life in COPD patients. Health and Quality of Life Outcomes, Vol. 8; published in Sep 2010, available at doi:10.1186/1477-7525-8-108.
- Cedano S, Belasco S.G.A, Traldi F, Machado M.C.L.O & Cássia A.R.D.(2012): Influence of socio-demographic and clinical characteristics and level of dependence on the quality of life of patients with COPD in prolonged home oxygen therapy: Bettencourt Brazilian Journal of Pulmonology. Vol. 38. No 3; published in June 2012 available at <http://dx.doi.org/10.1590/S1806-37132012000300008>
- Decramer M., Vogelmeier C., Bourbeau J., Anzueto A., Decramer M. & et al.(2016): Global Initiative for

- Chronic Obstructive Lung Disease (4<sup>th</sup> ed.). Leuven, Belgium: Global Initiative for Chronic Obstructive Lung Disease, Inc.
- Fitzpatrick, J. J., Alfes, C. M. & Hickman, R. L. (2018): A guide to mastery in clinical nursing: The comprehensive reference: Elsevier Inc, P 48.
- Gallefoss F, (2004): The effects of patient education in COPD in a 1-year follow-up randomised, controlled trial: Patient Education and Counseling. Vol. 52; published in March 2004 available at [https://doi.org/10.1016/S0738-3991\(03\)00100-9](https://doi.org/10.1016/S0738-3991(03)00100-9).
- Garrity E & Vigneswaran W. (2016). Lung Transplantation. London: Informa Healthcare.
- Hernandez, P., Balter, M., Bourbeau, J., & Hodder, R. (2009): Living with chronic obstructive pulmonary disease: A survey of patients' knowledge and attitudes. *Respiratory Medicine*, vol. 10; published in July 2016 available at doi:10.1016/j.rmed.2009.01.018
- Institut de recherches cliniques de Montréal. (2008). Lifestyle questionnaire. Québec, Canada.
- Lapperre T.S, Postma D.S, Gosman M.M.E., Snoeck- Stroband J.B, Ten Hacken N.H.T, Hiemstra P.S, Timens W, Sterk P.J. & Mauad T, (2006): Relation between duration of smoking cessation and bronchial inflammation in COPD: *Respiratory Medicine: COPD Journal*. Vol. 61; published in 27 January 2006 available at doi: 10.1136/thx.2006.awfeb06
- Martin, A. (2008): Health-related quality of life in outpatients with COPD in daily practice: the VICE Spanish study. *International Journal of Chronic Obstructive Pulmonary Disease*, Vol 3. published in Dec 2008; available at doi:10.2147/copd.s4791
- Matzo, M. & Sherman D.W. (2018): *Palliative Care Nursing: Quality Care to the End of Life*, 5<sup>th</sup> ed. New York: Springer Publishing Company. PP: 353-360.
- Miller, L.H., Smith, A.D. (1988): *The Miller-Smith Lifestyle Assessment Inventory*. Boston Medical Centre, Stress Manual Audit. Bookline, MA: Biobehavioral Associates.
- Mitsiki, E.E., Bania, E., Varounis, C., Gourgoulianis, K. & Alexopoulos, E. (2015): Characteristics of prevalent and new COPD cases in Greece: the GOLDEN study: *International Journal of Chronic Obstructive Pulmonary Disease*. Vol 10; published in 20 July 2015 available at doi: 10.2147/COPD.S81468.
- Nakken, N., Janssen, D.J.A., van den Bogaart, E.H.A., Muris, J.W.M., Vercoulen, J.H., Custers, F.L., Bootsma, G.P., Gronenschild, M.H.M., Wouters, E.F.M. & Spruit, M.A. (2016): Late-Breaking Abstract: Knowledge gaps in patients with COPD and their proxies: *European Respiratory Journal*. Vol. 48; published in April 2016 available at <https://doi.10.1183/13993003>.
- Panos, R. & Eschenbacher, W. (2015). *A COPD Primer*. Walter de Gruyter GmbH & Co KG.
- Said, A., Ewis, A., Omran, A., Magdy, M. & Saleeb, M. (2015): Prevalence

- and predictors of chronic obstructive pulmonary disease among high-risk Egyptians. *Air ways in health and disease*, Vol. 9; Published in March 2015 available at doi: 10.4103/1687-8426.153586.
- Wong, C. K. & Yu, W. C. (2016): Correlates of disease-specific knowledge in Chinese patients with COPD. *International Journal of Chronic Obstructive Pulmonary Disease* vol. 11; published in 14 Sep 2016 available at doi:10.2147/copd.s112176
- Yin, P., Zhang, M., Li, Y., Jiang, Y. & Zhao, W. (2011): Prevalence of COPD and its association with socioeconomic status in China: Findings from China Chronic Disease Risk Factor Surveillance 2007. *BMC Public Health Journal*. Vol. 11; published in 22 July 2012 available at <https://doi.org/10.1186/1471-2458-11-586>