

Awareness and Impact of COPD in Korea: An Epidemiologic Insight Survey

Yong Il Hwang, M.D.¹, O Jung Kwon, M.D.², Young Whan Kim, M.D.³, Young Sam Kim, M.D.⁴, Yong Bum Park, M.D.¹, Myung-Goo Lee, M.D.¹, Dong-Gyu Kim, M.D.¹, Seung Hun Jang, M.D.¹, Ki-Suck Jung, M.D.¹,
On behalf of Korean Academic of Tuberculosis and Respiratory Disease

¹Department of Pulmonary, Allergy and Critical Care Medicine, Hallym University College of Medicine, ²Department of Internal Medicine, Samsung Medical Center, Sungkyunkwan University School of Medicine, ³Department of Internal Medicine, Seoul National University Hospital, Seoul National University College of Medicine, ⁴Department of Internal Medicine, Yonsei University College of Medicine, Seoul, Korea

Background: There were a few studies which were conducted to know about the behavior of the chronic obstructive pulmonary diseases (COPD) patients. The aims of this study was to explore the behaviour of COPD patients, such as awareness and impact of disease, the pathway of visiting doctors, and the treatment pattern and preference.

Methods: A face-to-face interview of 300 subjects with COPD was conducted.

Results: The most concerned symptom which made the respondents to visit the hospital was 'breathlessness' (78%). Only 58% of them knew the exact diagnosis. Seventy-three percent of them visited the hospital 'once a month' or 'once every 2 month'. They have made 12.8 prescheduled visits to the hospital in the past 1 year. Unscheduled visits and hospital stay figured to two in the past year. Only 11% of respondents felt they were currently in good health. 'Severe' and 'very severe' COPD patients perceived their health to be in a worse condition than 'mild' and 'moderate' COPD patients. When conditions worsened, 42% of patients were hospitalized. The most common prescription treatment was a fixed combination of inhaled corticosteroids and long-acting β_2 agonists (48%), followed by a long acting anticholinergics (38%).

Conclusion: Over forty percent of the patients didn't know exactly about their condition. Most of them had a negative attitude toward their current health status. Doctors need to know more about COPD patients in terms of their attitude toward the disease, impact of the disease, interaction with healthcare professionals and treatment related problems.

Key Words: Pulmonary Disease, Chronic Obstructive; Behavior; Data Collection

Introduction

Chronic obstructive pulmonary disease (COPD) is a major contributor to global mortality and morbidity and its worldwide prevalence is predicted to increase further. In 2001, COPD was the fifth leading cause of

total deaths among high-income countries¹. Consequently, COPD results in an economic and social burden that is both substantial and increasing. Therefore, the importance of COPD is being increasingly recognised by the public health community. The Global Obstructive Lung Disease (GOLD) guideline is developed to provide a more uniform set of recommendations for the diagnosis and management of COPD and to increase subject and public awareness and understanding of this condition². However, there were few studies on the awareness or understanding of the patients with COPD³ after GOLD guideline released.

In Korea, it was reported that the prevalence of

Address for correspondence: **Ki-Suck Jung, M.D.**

Division of Pulmonary, Allergy and Critical Care Medicine,
Department of Internal Medicine, Hallym University Sacred
Heart Hospital, 896, Pyeongan-dong, Dongan-gu, Anyang
431-796, Korea

Phone: 82-31-380-3715, Fax: 82-31-380-3973

E-mail: pulmoks@hallym.ac.kr

Received: Jun. 3, 2011

Accepted: Sep. 22, 2011

COPD is 17.2% of among subjects over 45 years of age and only one-fourth of the subjects with COPD have a diagnosis of COPD⁴. The COPD Insight Survey is a nationwide survey in Korea to explore the behaviour of COPD patients. This report describes the awareness and impact of the disease, the pathway of visiting doctors, and the treatment pattern and preferred issues in the COPD patients.

Materials and Methods

1. Study design

This study was based on the nation-wide survey including urban and rural areas in Korea. Eligible subjects were the patients who visited university-affiliated hospitals after having been diagnosed with COPD according to the GOLD guideline. The distributions of participating centers were as follows; 33% in Seoul, Gyeonggi-do, and Gangwon-do, 9% in Daegu and Gyeongsangbuk-do, 9% in Busan and Gyeongsangnam-do, 9% in Jeolla province and 6% in Chungcheong province. The severity of airflow limitation was also determined according to the spirometric classification recommended in the GOLD guideline (Figure 1)². Physicians were asked to enroll one of each different severity level of COPD. A face-to-face interview was conducted with the patients in the waiting area of the hospital upon physicians' permission. A total three hundreds patients were interviewed in the survey.

2. Data collection

The interviews were conducted using a structured questionnaire. By using the questionnaire, we evaluated the awareness and impact of COPD, visiting pattern and hospital utilization, and their medication in COPD patients. The average time to complete the full questionnaire was 40 minutes.

The questionnaire included four sections in addition to a demographic section: the first two sections were designed to identify the attitudes toward and impact of COPD, and the last two sections collected information to assess the interaction with healthcare professionals and the treatment preference. The attitude and impact section included the information about the disease, experience on worsening condition and recognition of health condition. The impact of COPD and its treatment was evaluated by the Korean version of St. George's Respiratory Questionnaire (SGRQ) which was validated in a Korean study⁵. The interaction with healthcare professions and treatment preference section included the attitude toward doctors, the treatment pattern, and the satisfaction with the treatment.

3. Data analysis

Data were analyzed using the statistical package SPSS (SPSS Inc., Chicago, IL, USA). T-test and ANOVA were used for the comparison between the subgroups classified by the GOLD guideline. p-values < 0.05 were re-

Respondent eligibility	<ul style="list-style-type: none">○ Patients who have visited in hospital after having diagnosed COPD																				
Area	<ul style="list-style-type: none">○ Nation-wide																				
Sample size	<ul style="list-style-type: none">○ Total 300 subjects																				
	<table><tr><th colspan="5">Severity type</th></tr><tr><th>Mild</th><th>Moderate</th><th>Severe</th><th>Very severe</th><th>Total</th></tr><tr><td>69</td><td>75</td><td>96</td><td>60</td><td>300 Pers.</td></tr><tr><td>23%</td><td>25%</td><td>32%</td><td>20%</td><td>100%</td></tr></table>	Severity type					Mild	Moderate	Severe	Very severe	Total	69	75	96	60	300 Pers.	23%	25%	32%	20%	100%
	Severity type																				
Mild	Moderate	Severe	Very severe	Total																	
69	75	96	60	300 Pers.																	
23%	25%	32%	20%	100%																	
Recruitment method	<ul style="list-style-type: none">○ Recruited the patients in waiting area in the hospital upon physicians' permission																				
Data collection	<ul style="list-style-type: none">○ Face-to-face interview																				

Figure 1. Study design.

garded as statistically significant.

Results

Of the 300 subjects, male (85.3%) were far more common than female (14.7%). The advanced age of the sixties and seventies (75.3%) was more dominant than other age groups. According to the spirometric classification, sixty nine patients (23.0%) had mild obstruction, seventy five (25.0%) had moderate, ninety six

(23.0%) had severe, and another sixty (20.0%) had very severe obstruction. The proportion of well-educated respondents was relatively low (Table 1).

A majority (83.6%) of respondents had smoked at some point in their lives, and 16.3% of the respondents were still smoking. The average amount of smoking was 23.5 cigarettes per day, for an average duration of 38.7 years. Severe patients have smoked for a longer time than those with other levels of severity (Table 2).

Duration of symptoms varied widely, but on average, respondents experienced their first symptoms 10 years prior to interview. 'Breathlessness' was by far the most frequent reason (78.3%) for visiting a doctor for the first time, followed by cough and sputum.

As for frequency of visiting the hospital, 'once a month' scored the highest response rate (54%), followed by 'once every 2 months' (23.3%). They made an average of 13 prescheduled visits in the past one year. They also made an average 2 unscheduled visits (emergency visits or admission) in the past year. Severe and very severe COPD patients showed a higher frequency of regular visits and hospitalizations than mild and moderate degree patients (Table 3).

Table 1. Demographic characteristics of the respondents

Male:Female	85.3:14.7
Age group, yr	
40~49	2.3
50~59	13.3
60~69	35.3
70~79	40.0
≥80	9.0
Education	
None education	6.3
Elementary school	36.3
Middle-high school	42.7
Under graduate school	13.0
Graduate school	13.0

Data are presented as percentage.

Table 2. Smoking status according to disease severity

	Mild	Moderate	Severe	Very severe	Total
Current smoking status					
Current smoke	24.6*	21.3 [†]	11.5	8.3	16.3
Ex-smoker	58.0	60.0	75.0	70.0	66.4
Never smoker	17.4	18.7	13.5	21.7	17.3
Smoking amount and period					
Daily smoking amount, cigarettes	22.1	23.8	25.7 [†]	20.7	23.5
Period of smoking, yr	38.1	38.7	40.5 [†]	36.0	38.7

*p<0.05 compared to severe and very severe groups, [†]p<0.05 compared to very severe groups.

Table 3. Visiting frequency related to chest trouble in recent the past 1 year (times)

	Total	Mild	Moderate	Severe	Very severe
Regular visit to hospital	12.8	7.0*	9.0	21.0	10.1
Emergency visit to hospital	2.1	1.6	2.0	2.0	2.4
Admission (hospital stay)	1.9	1.1	1.4	2.0	2.1 [†]

*p<0.05, compared to all other groups, [†]p<0.05 compared to mild and moderate groups.

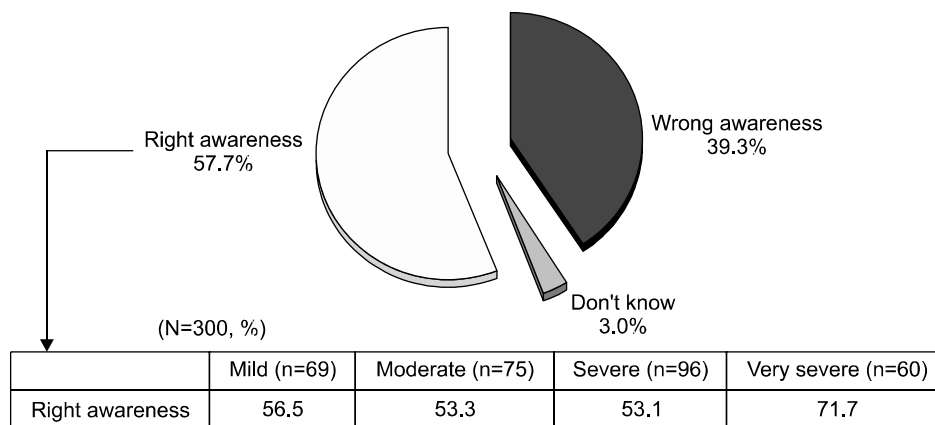


Figure 2. Awareness of diagnosis. Only 57.7% of the subjects knew the exact diagnosis of their medical condition.

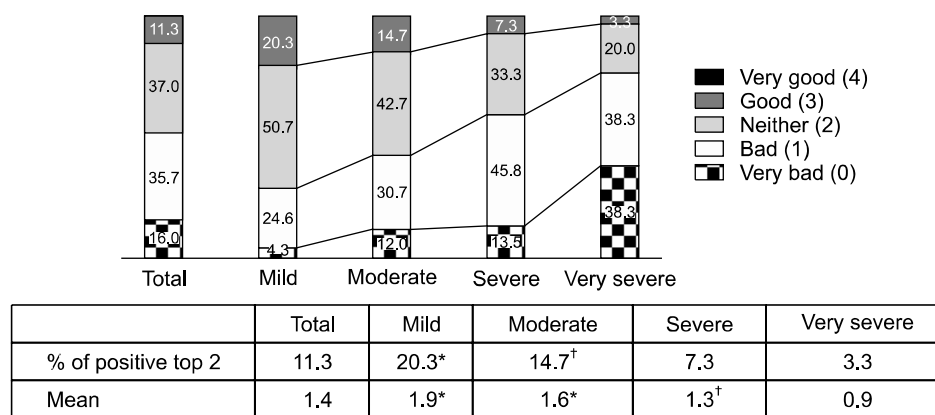


Figure 3. Recognition of health condition according to the disease severity. Only 11.3% of respondents answered that they were in good health. * $p < 0.05$, compared to severe and very severe group, [†] $p < 0.05$, compared to very severe group.

1. Attitude toward the disease

1) Awareness of COPD: Among total respondents, only 173 (57.7%) subjects knew the exact diagnosis of their medical condition. Very severe patients had the highest percentage (71.7%) of accurate awareness of their diagnosis than patients of other disease severity. Bronchial asthma was the most prevalent diagnosis of wrong awareness followed by chronic pulmonary disease and bronchiectasis (Figure 2).

2) Experience on worsening condition: During the year prior to the survey, about half of the respondents (51.0%) had experienced a worsening of their condition. When their conditions worsened, most of the respondents used hospital; hospitalization in 41.7%, emergency room (ER) visit in 28.7%, and unscheduled visit to hospital in 17.0 %. The mean frequency of worsening condition for hospitalization was 2.2/patient/year. The frequencies of ER visits and emergency visits due to

worsening condition were 1.8 and 4.0, respectively.

2. Impact of the disease

1) Recognition of health condition: Most respondents thought that their health is in bad condition. Only 11.3% of respondents answered that they were in good health. No one answered that his or her condition was very good. 'Severe' and 'very severe' patients had a more negative perception about their health condition than 'mild' and 'moderate' patients (Figure 3). We also scored the respondents' health condition: 0, very bad, 1, bad, 2, neither, 3, good and 4, very good. The mean value of the respondents was 1.4, which significantly decreased as the disease severity worsened.

2) St. George respiratory questionnaire: The total score of the St. George Respiratory Questionnaire (SGRQ) of all respondents was quite high (48.3). There was a statistically significant increase of SGRQ scores as disease severity worsened. This reflected that milder

Table 4. St. George Respiratory Questionnaire according to the disease severity

	Total	Mild	Moderate	Severe	Very severe
Symptom score	52,6	37,4*	46,6	59,5	66,8
Activity score	63,6	41,6*	56,0	72,6	84,0
Impact score	38,3	18,5*	31,7	45,4	58,1
Total score	48,3	28,6*	41,5	55,9	67,3

*p<0,05, compared to all other groups.

patients tend to be less affected than more severe ones in their daily activity. For each individual score (symptom score, activity score, and impact score), there was also a significant correlation between severity and each score ($p<0,05$, Table 4).

3. Interaction with healthcare professionals

In general most respondents (88,0%) felt that they were being provided with enough information from their doctors in coping with their COPD. However, patients showed a low level of satisfaction with their doc-

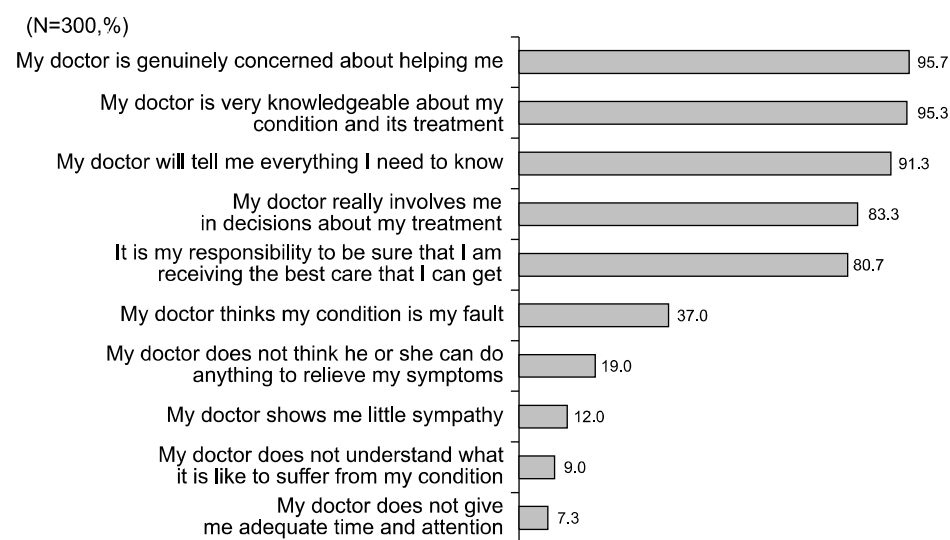


Figure 4. Attitude toward the doctors. Patients showed a low level of satisfaction with family doctors regarding emotional sympathy and being given adequate time and attention. Most respondents feel they are being provided with enough information from their family doctors.

Table 5. Present prescription treatment

	Total	Mild	Moderate	Severe	Very severe
Fixed combination of ICS and LABA	48,0	31,9*	53,3	52,1	53,3
Long acting anticholinergics	38,0	24,6	33,3	46,9 [†]	45,0 [†]
SABA	22,7	13,0	16,0	27,1 [†]	35,0 [†]
Short acting anticholinergics	19,0	13,0	13,3	24,0	25,0
LABA	16,7	13,0	17,3	15,6	21,7
Leukotriene receptor antagonist	12,0	14,5	12,0	11,5	21,7
ICS	8,7	4,3	10,7	9,4	10,0
Fixed combination of SABA and anticholinergics	5,0	5,8	10,7	9,4	10,0
Oxygen	5,0	1,4	1,3	5,2	13,3 [†]
No medication	3,0	4,3	5,3	1,0	1,7
Don't know the name	41,0	46,4	34,7	41,7	41,7

Data are presented as percentage.

*p<0,05, compared to all the other groups, [†]p<0,05 compared to the mild groups, [‡]p<0,05 compared to the mild and moderate groups.

ICS: inhaled corticosteroid; LABA: long acting beta2 agonist; SABA: short acting β 2 agonist.

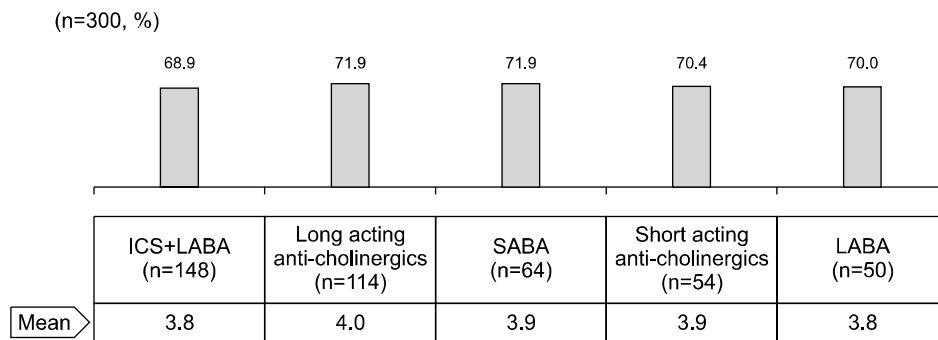


Figure 5. Present prescription treatment satisfaction (% of positive top 2 according to each inhaler type). On the whole, there was no significant difference in the satisfaction levels among present prescription treatments. ICS: inhaled corticosteroid; LABA: long acting beta2 agonist; SABA: short acting beta2 agonist.

tors regarding emotional sympathy and being given adequate time and attention (Figure 4).

4. Treatment preference

Overall, the most common treatment prescription for the condition of the respondents was a fixed combination of inhaled corticosteroids and long-acting β_2 agonists (48.0%), followed by long-acting anticholinergics (38.0%). As expected, the treatment rate was low in the mild group compared to other groups. Forty-one percent of the respondents didn't know the exact name of at least one of their prescriptions (Table 5). Inhaler type was received favorably. There was no significant difference in satisfaction levels or preference among the inhalers (Figure 5).

A total 71.3% of respondents answered that they had never experienced any side effects with the prescription, and 28.7% had experienced adverse events such as dry mouth (44.0%), palpitation (17.4%), headache (12.8%), and so forth. In the case of very severe patients, 46.7% had experienced adverse events, which was a significantly higher rate than other severity groups.

Discussion

COPD is currently becoming a prevalent lung disease in Korea because the Korean population has a high rate of smoking and the country became industrialized rap-

idly over the past 30 years⁶. The prevalence rate of COPD including mild degree was 17.2% from the 1st nationwide survey⁴. In this study, we enrolled 300 COPD patients who were treated as COPD by pulmonary specialists. Surprisingly 42% of the respondents didn't know the exact diagnosis. Among the wrong awareness, bronchial asthma was the most frequent diagnosis followed by chronic pulmonary disease and chronic bronchiectasis. Even in the very severe patients, about 30% of the respondents were wrongly aware of their condition. We thought that our study was the first of its kind to figure out the awareness of the diagnosis in COPD patients, although some epidemiology studies stated the rate of undiagnosed subjects who fulfilled diagnostic criteria for COPD^{3,4}. This high rate of wrong awareness might reflect the poor communication between physicians and patients. It is well-known that health education can play a role in improving the ability to cope with illness and health status for COPD patients². Therefore, the right awareness of their condition is imperative. To raise awareness of COPD and enhance effective management of the disease, a multidisciplinary team approach is required, including active participation of patients and their families⁷.

As COPD progresses, visits to health care facilities increase in frequency². The respondents had made an average of 13 regular visits to hospital in this survey. The number of regular visits was less for the mild patients than that of other severity. About half of the re-

spondents visited hospital 'once a month' in this survey, which was higher than previous reports³. The ratio of never experiencing and having experienced worsening condition during the year prior to the survey was about 1:1, which was also higher than previous reports³. These discrepancies might be due to a higher proportion of the severe and very severe group of the study population than previous epidemiologic studies^{4,8-11}.

COPD is known to have a negative impact on the health-related quality of life¹²⁻¹⁵, so, we also evaluated the health status and quality of life of the respondents. The SGRQ score in this survey was comparable to that of Rutten-van Mölken et al's¹². Most of the respondents thought that their health status was bad. Interestingly, even in mild patients, over 25% of the respondents felt that their conditions were bad. This meant that there might be some other factors that influence the health status of COPD patients besides the degree of disease severity only classified by FEV₁, such as poor exercise capacity, history of exacerbation, etc.

The respondents showed different levels of satisfaction toward their doctors. They showed a high level of satisfaction regarding the treatment but a low level of satisfaction regarding emotional sympathy and being given adequate time and attention. This suggested the importance of communication between the physicians and the patients. The respondents were generally satisfied with their present medication.

We believe this study to be the first survey in Asia which put emphasis on the insight of COPD patients. However, this study had some limitations. First, the proportion of severe and very severe patient was higher than that of previous epidemiologic studies^{4,8-11}, so the possibility of the exaggeration of the disease impact existed. However, with the disease severity being intentionally evenly distributed, comparison between 4 different disease severities was feasible. Second, this study was cross-sectional and retrospective; there was no definition of acute exacerbation. We asked the use of medical service, such as hospitalization, ER visit, and unscheduled visit. Therefore it is conceivable that worsening condition didn't necessarily mean the acute ex-

acerbation of COPD. Using the term of worsening condition might underestimate the frequency of acute exacerbation compared to using a conventional definition².

In conclusion, over 40 percent of COPD patients didn't know exactly about their condition. Most of them had negative attitudes toward their current health status. In addition, patients showed a low level of satisfaction regarding emotional sympathy and being given adequate time and attention. Doctors need to know more about COPD patients in terms of their attitude toward the disease, impact of the disease, interaction with health care professionals and treatment related problems.

References

1. Lopez AD, Mathers CD, Ezzati M, Jamison DT, Murray CJ. Global and regional burden of disease and risk factors, 2001: systematic analysis of population health data. *Lancet* 2006;367:1747-57.
2. Global Initiative for Chronic Obstructive Lung Disease (GOLD). Global strategy for the diagnosis, management, and prevention of chronic obstructive pulmonary disease. 2006 Revision. GOLD; 2006 [cited 2007 Jan 25]. Available from: URL: http://www.goldcopd.org/uploads/users/files/GOLDReport2006_0122.pdf.
3. Rennard S, Decramer M, Calverley PM, Pride NB, Soriano JB, Vermeire PA, et al. Impact of COPD in North America and Europe in 2000: subjects' perspective of Confronting COPD International Survey. *Eur Respir J* 2002;20:799-805.
4. Kim DS, Kim YS, Jung KS, Chang JH, Lim CM, Lee JH, et al. Prevalence of chronic obstructive pulmonary disease in Korea: a population-based spirometry survey. *Am J Respir Crit Care Med* 2005;172:842-7.
5. Kim YS, Byun MK, Jung WY, Jeong JH, Choi SB, Kang SM, et al. Validation of the Korean version of the St. George's Respiratory Questionnaire for patients with chronic respiratory disease. *Tuberc Respir Dis* 2006; 61:121-8.
6. Shim YS. Epidemiological survey of chronic obstructive pulmonary disease and alpha-1 antitrypsin deficiency in Korea. *Respirology* 2001;6:S9-11.
7. Zielinski J, Bednarek M, Górecka D, Vieg G, Hurd SS, Fukuchi Y, et al. Increasing COPD awareness. *Eur Respir J* 2006;27:833-52.

8. Buist AS, McBurnie MA, Vollmer WM, Gillespie S, Burney P, Mannino DM, et al. International variation in the prevalence of COPD (the BOLD Study): a population-based prevalence study. *Lancet* 2007;370:741-50.
9. Menezes AM, Perez-Padilla R, Jardim JR, Muñio A, Lopez MV, Valdivia G, et al. Chronic obstructive pulmonary disease in five Latin American cities (the PLATINO study): a prevalence study. *Lancet* 2005;366:1875-81.
10. Fukuchi Y, Nishimura M, Ichinose M, Adachi M, Nagai A, Kuriyama T, et al. COPD in Japan: the Nippon COPD Epidemiology study. *Respirology* 2004;9:458-65.
11. Regional COPD Working Group. COPD prevalence in 12 Asia-Pacific countries and regions: projections based on the COPD prevalence estimation model. *Respirology* 2003;8:192-8.
12. Rutten-van Mölken MP, Oostenbrink JB, Tashkin DP, Burkhart D, Monz BU. Does quality of life of COPD patients as measured by the generic EuroQol five-dimension questionnaire differentiate between COPD severity stages? *Chest* 2006;130:1117-28.
13. Carrasco Garrido P, de Miguel Díez J, Rejas Gutiérrez J, Centeno AM, Gobartt Vázquez E, Gil de Miguel A, et al. Negative impact of chronic obstructive pulmonary disease on the health-related quality of life of patients. Results of the EPIDEPOC study. *Health Qual Life Outcomes* 2006;4:31.
14. Kessler R, Ståhl E, Vogelmeier C, Haughney J, Trudeau E, Löfdahl CG, et al. Patient understanding, detection, and experience of COPD exacerbations: an observational, interview-based study. *Chest* 2006;130:133-42.
15. Wyrwich KW, Metz SM, Kroenke K, Tierney WM, Babu AN, Wolinsky FD. Measuring patient and clinician perspectives to evaluate change in health-related quality of life among patients with chronic obstructive pulmonary disease. *J Gen Intern Med* 2007;22:161-70.