

Panagiota Koutsimpou¹, Konstantinos Gourgoulianis², Athina Economou³, Vasilios Raftopoulos⁴

¹Municipality of Volos, Greece

²University of Thessaly Medical School, Greece

³University of Thessaly, Greece

⁴National Public Health Organization, Athens, Greece

Health status of patients who suffer from COPD, asthma and acute respiratory diseases in Greece in the era of economic crisis

Abstract

Introduction: In Greece, the last decade, the harsh austerity measures, that were enacted, had a huge impact on patients' suffering from chronic diseases. The aim of the current study was to assess the financial ability of the patients suffering from an acute or chronic respiratory disease hospitalized in an urban pulmonary university clinic in central Greece and to explore the correlation of their health status with their financial ability.

Material and methods: An anonymous and self completed questionnaire was administered in the Greek language. It included the SF-36 and the EQ-5D-3L scale that are validated in the Greek language and a new scale (Financial Ability Scale, FAS) that has been developed and validated.

Results: Half of the patients (55%) suffered from a chronic respiratory disease (64% COPD and 36% asthma) while 45% from an acute respiratory disease (pneumonia). Those suffering from COPD were mainly males (88.7%), over 65 years old (74.6%), with primary education or some primary (83.1%), covered by public health insurance (95.8%) and living with their families (91.5%). With the exception of anxiety/depression, the more the problems with mobility, self-care, usual activities and pain/discomfort, the worse the financial ability of the participants. Those > 65 years old, with fewer years of education, suffering from a chronic disease and those having a better experience from the current hospitalization, had a statistically significant lower VAS. Those aged > 65 years old reported a lower financial ability (26.00 ± 9.41 vs 29.24 ± 10.63) as well as those with a chronic respiratory disease (24.18 ± 7.90 vs 30.57 ± 11.98). The years lived with the disease correlated statistically and negatively ($r = -0.232$; $p = 0.001$) with the total financial ability score.

Conclusion: Economic crisis in Greece, affected COPD burden in terms of financial ability, and quality of life.

Key words: COPD, economic crisis, COPD burden, EQ-5D-3L

Adv Respir Med. 2019; 87: 167–174

Introduction

Chronic respiratory diseases and mainly chronic obstructive pulmonary diseases (COPD) have traditionally a social and economic impact on the individuals and their families. COPD is a leading cause of morbidity and mortality worldwide, which induces a socioeconomic burden. According to the 2018 GOLD report (www.goldcopd.org), COPD prevalence varies across the countries due to the different criteria and the used methodology. It is estimated that in Europe (in four European regions with

available data), the global mean prevalence of COPD is 12.38% [1].

Socioeconomic status remains a dominant social predictor of health, while lower education, lower household income, and lower socioeconomic status are associated with COPD [2, 3]. Additionally, socioeconomic status has a direct impact on health status in response to treatment for COPD [4]. Greece belongs to the countries with an estimated COPD prevalence between 15–20%. According to the Greek Obstructive Lung Disease Epidemiology and health ecoNomics (GOLDEN) study, the current profile of COPD patients in Greece includes: medi-

Address for correspondence: Vasilios Raftopoulos, National Public Health Organization, Athens, Greece; e-mail: vraftop1@gmail.com

DOI: 10.5603/ARM.2019.0028

Received: 28.01.2019

Copyright © 2019 PTChP

ISSN 2451–4934

an age 68 years, male gender (71.3%), overweight, current and ex-smokers and high prevalence of comorbidities. Given that over the last decade in Greece, the harsh austerity measures were enacted, which had a huge impact on vulnerable people and their families, there is a need to assess the socioeconomic profile of those who suffer from chronic respiratory diseases with an emphasis on their health status and their financial ability.

Aim

The aim of the current study was to assess the financial ability of the patients who suffer from COPD, asthma or an acute respiratory disease hospitalized in an urban pulmonary university clinic in central Greece and to explore the correlation of their health status with their financial ability.

Material and methods

Two hundred and two hospitalized patients who met the following inclusion criteria participated in the study: 1) willingness to participate; 2) 18 years of age and older; 3) ability to speak and read Greek; and 4) suffering from acute or chronic respiratory diseases; and 5) hospitalized for at least three days; and 6) not suffering from a mental disorder. The patients were recruited on the basis of their availability and their willingness to participate. The researchers have approached them and were given a short explanation of the purpose and the aim of the study. An informed consent was obtained from those who agreed to participate, and they were asked to complete the questionnaire. They were also informed of their right to withdraw from the study at any time. To assess their mental status, mini-mental state examination has been used.

An anonymous and self-completed questionnaire was administered in the Greek language. The first part of the questionnaire included several questions to elicit information on the socio-demographic characteristics of the participants, health status and details about their hospitalization. The second part of the questionnaire included the Short Form 36 (SF-36) and the EQ-5D-3L scale that are validated in the Greek language [5, 6]. SF-36 is a well-established scale that measures health status and consists of eight subscales (vitality, physical functioning, bodily pain, general health perceptions, physical role functioning, emotional role functioning, social role functioning and mental health). Each subscale produces a weighted sum of the items and each is transformed into a 0–100 scale on

the assumption that each question carries equal weight. A high score indicates less disability. EQ-5D-3L is a standardized measure of health status developed by the EuroQol Group in order to provide a simple, generic measure of health for clinical and economic appraisal [7]. It includes the EQ-5D descriptive system and the EQ Visual Analogue Scale (EQ VAS). The EQ-5D comprises 5 dimensions: mobility, self-care, usual activities, pain/discomfort and anxiety/depression, asking from the participants to rate each question by using a three-point Likert scale: no problems, some problems, extreme problems. The EQ VAS records the respondent's self-rated health by using a visual analogue scale ranging from "best imaginable health state" to "worst imaginable health state" extending from 0–100.

In order to assess the financial ability of the participants as an indirect measure of the impact of economic crisis in Greece on their financial status, a 12-item scale has been developed. The pool of questions derived from content analysis of two focus groups with patients suffering from respiratory diseases. Consideration was given to the balance of the questions within the modules and to the inclusion of phrases and words that users applied to evaluate their financial ability. The scale was tested in a pilot study sample in order to explore the degree of understanding of the questions by the interviewees. Minor changes in the wording were suggested by the pilot study. The scale (Financial Ability Scale, FAS) has been assessed also by a panel of five experts who reviewed the questionnaire and confirmed the scale with minor wording changes. The participants were called to answer each question (how do you rate your ability to...) by using a 5-point Likert scale (very good, good, moderate, little, no ability). Thus the scores range from 12–60. The Cronbach's alpha of the FAS was 0.962, which is an excellent result indicating a very high internal consistency of the items. Exploratory factor analysis of FAS revealed one factor that explained 73.47% of the total variance of the scores. The Cronbach's alpha of the EQ-5D-3L was 0.74.

Ethics

The Primary Care Master Program of the University of Thessaly, acting as an ethics committee, granted written ethical approval for the study. Permission to carry out the study in the healthcare settings was provided by the Scientific Council of the Public Hospital in which the participants were hospitalized.

Statistical analysis

All of the items were coded and scored, and the completed questionnaires were included in the data analysis set. IBM-SPSS-24 was used to analyze the data. The chi-squared test was applied to explore the existence of a statistically significant relationship between the categorical variables. The student's t-test was used to assess whether the means of the two groups were statistically different from each other, while ANOVA with post-hoc Bonferroni test (in case of equal variances) or Dunnett's test (in case of non-equal variances) were applied for the three groups. Values < 0.05 were considered to be statistically significant, unless otherwise stated. All the variables were normally distributed unless otherwise stated.

Results

The majority of the participants (57.4%) were males while two thirds of them were > 65 years old. Only one third of them had a secondary or tertiary education. The vast majority (98%) were Greek citizens, covered by a public health

insurance scheme (95%), living with their families (85%). Half of the patients (55%) suffered from a chronic respiratory disease (64% COPD and 36% asthma) while 45% from an acute respiratory disease (pneumonia). Those suffering from COPD were mainly males (88.7%), over 65 years old (74.6%), with primary education or some primary (83.1%), covered by public health insurance (95.8%) and living with their families (91.5%). On the other hand, those suffering from asthma were mainly females (87.8%), over 65 years old (70.7%), with primary education or some primary (95.1%) covered by public health insurance (92.7%) and living with their families (84.5%). Regarding those hospitalized with acute respiratory disease, they were mainly males (53.8%), over 65 years old (60.4%), with primary education or some primary (60.5%), covered by public health insurance (95.6%) and living with their families (80.2%).

EQ-5D-3L

As seen in Table 1, the majority of the participants reported some difficulties walking, no problems with self-care, or with performing their usual activities, no pain or discomfort, but they

Table 1. Mean FAS and EQ-5D-3L

EQ-5D-3L items	FAS score			
	N	Mean	SD	p-value
Mobility				
I have no problems in walking about	85	31.07	11.23	< 0.001
I have some problems in walking about	97	24.47	7.98	
I am confined to bed	20	22.60	5.79	
Self-care				
I have no problems with self-care	141	28.66	10.69	0.002
I have some problems washing or dressing myself	34	23.44	7.05	
I am unable to wash or dress myself	27	23.25	5.98	
Usual activities				
I have no problems with performing my usual activities	97	29.74	11.14	< 0.001
I have some problems with performing my usual activities	53	26.60	9.14	
I am unable to perform my usual activities	52	22.53	5.82	
Pain/discomfort				
I have no pain or discomfort	97	30.57	11.51	< 0.001
I have moderate pain or discomfort	84	24.30	6.99	
I have extreme pain or discomfort	21	21.85	5.40	
Anxiety/depression				
I am not anxious or depressed	26	28.42	11.87	0.669
I am moderately anxious or depressed	49	27.34	10.13	
I am extremely anxious or depressed	127	26.67	9.44	

Table 2. Mean VAS and socio-demographic characteristics

Variable	Mean ± SD	p-value
Gender		
Men	54.52 ± 22.39	0.948
Women	54.72 ± 21.48	
Age group		
< 65	66.79 ± 24.56	< 0.001
> 65	48.69 ± 17.87	
Education		
Illiterate	46.81 ± 16.37	< 0.001
Some primary	48.07 ± 18.01	
Primary	52.01 ± 20.52	
Secondary	68.97 ± 26.21	
Tertiary	68.16 ± 20.56	
Respiratory disease		
COPD	44.65 ± 17.12	< 0.001
Asthma	47.58 ± 17.44	
Acute	65.47 ± 22.42	
Current hospitalization		
Worse compared to other times	60.86 ± 20.06	0.020
Good as other times	47.36 ± 20.10	
Better compared to other times	48.33 ± 20.28	

were extremely anxious or depressed. With the exception of anxiety/depression, the more the problems with mobility, self-care, usual activities and pain/discomfort, the worse the financial ability of the participants. This group of patients seems to be more vulnerable.

The mean VAS score was 54.60 ± 21.95 (median 50, min: 10 max: 100). As it is shown in Table 2, those > 65 years old, with fewer years of education, suffering from COPD and those having a better experience from the current hospitalization, had a statistically significant lower VAS.

Financial ability

As seen in Table 3, the participants had a relatively low ability to cover their regular expenses. After summing the scores, the mean total financial ability outcome was 27.06 ± 9.92 (median 24 and range 12–57). Dunnett's test revealed that those with an acute respiratory disease had statistically significant higher FAS compared to those with COPD or asthma. The same test revealed similar findings also regarding the items 2, 4, 5, 8, 10–12. Additionally, the Bonferroni test showed that those with an acute respiratory disease had statistically significant

higher scores for the items 1, 3, 6, 7, 9 compared to those with COPD or asthma.

The gender, level of education, family status, region of living did not correlate with the financial ability as opposed to the age group ($p = 0.029$), the disease ($p < 0.001$) and the years lived with the disease. Those aged > 65 reported a lower financial ability (26.00 ± 9.41 vs 29.24 ± 10.63) as well as those with COPD (24.08 ± 7.49 vs 30.66 ± 11.01 for those with acute respiratory diseases vs 24.37 ± 8.69 for those with asthma). The years lived with the disease correlated statistically and negatively ($r = -0.232$; $p = 0.001$) with the total financial ability score.

SF-36

The participants had relatively very low General Health (GH) perception and Physical Role (PR) functioning scores followed by low scores of Vitality (V), Physical Functioning (PF) and Mental Health (MH). They had better scores of Social Role (SR) functioning, Bodily Pain (BP) and Emotional Role (ER) functioning (Table 4).

As seen in Table 4, the FAS total score correlated statistically significantly with all the subscales of SF-36. Low subscale score correlated with low financial ability results of the participants. There was a weak correlation between Emotional Role functioning and FAS score. Additionally, there was a very strong and positive correlation of Physical functioning, General Health Perception, Social Role functioning, Physical Role functioning and Vitality with VAS score.

Bonferroni test revealed that the patients with an acute respiratory disease had statistically significant higher scores for the subscales VT, SF and BP compared to those with COPD or asthma. Dunnett's test discovered similar findings for the subscales PF, RP, RE and GH.

Discussion

The aim of the current study was to assess the socioeconomic profile of a sample of patients suffering from chronic respiratory diseases, and hospitalized in a large University Pulmonary Medicine Clinic in central Greece. According to our results, the vast majority of the hospitalized people suffering from COPD were males, aged > 65. This is a constant finding compared with other Greek studies that were conducted during the Greek economic crisis period [8–13], as well as prior to the economic crisis period [14, 15].

The financial ability of the participants of the current study is strongly associated with low

Table 3. Differences between those who suffer from COPD, asthma and acute respiratory disease regarding each item of the FAS

Item	Mean	SD	Disease	N	Mean	SD	p-value
To buy basic goods (supermarket)	2.97	0.90	COPD	71	2.66	0.77	< 0.001
			Acute	90	3.29	0.92	
			Asthma	40	2.80	0.88	
To spend money for the house maintenance	2.22	1.14	COPD	71	1.99	0.91	< 0.001
			Acute	90	2.61	1.20	
			Asthma	40	1.78	1.12	
To spend money for heating	2.76	1.00	COPD	71	2.58	0.92	0.004
			Acute	90	3.02	1.04	
			Asthma	40	2.50	0.96	
To buy clothes and shoes	1.88	1.14	COPD	71	1.45	0.78	< 0.001
			Acute	90	2.34	1.24	
			Asthma	40	1.60	1.05	
To amuse themselves (entertainment, trips)	1.70	1.09	COPD	71	1.31	0.64	< 0.001
			Acute	90	2.10	1.24	
			Asthma	40	1.50	1.08	
To cover the expenses for paying bills	2.90	0.98	COPD	71	2.66	0.89	< 0.001
			Acute	90	3.20	1.00	
			Asthma	40	2.63	0.92	
To cover the expenses for taxation	2.84	0.97	COPD	71	2.65	0.86	0.006
			Acute	90	3.08	1.04	
			Asthma	40	2.63	0.92	
To share the expenses of their relatives (children, grandchildren)	1.97	1.15	COPD	71	1.68	0.95	0.001
			Acute	90	2.31	1.27	
			Asthma	40	1.75	1.00	
To cover the expenses for their medicines	3.26	0.90	COPD	71	3.08	0.84	0.016
			Acute	90	3.47	0.93	
			Asthma	40	3.13	0.88	
To cover the expenses for other therapies (physio, dental etc)	2.19	1.20	COPD	71	1.87	0.94	< 0.001
			Acute	90	2.60	1.33	
			Asthma	40	1.88	1.06	
To save money	1.25	0.49	COPD	71	1.10	0.34	< 0.001
			Acute	90	1.40	0.59	
			Asthma	40	1.18	0.38	
To have a housekeeper	1.13	0.42	COPD	71	1.06	0.23	0.003
			Acute	90	1.24	0.56	
			Asthma	40	1.03	0.15	
Total score	27.06	9.92	COPD	71	24.08	7.49	< 0.001
			Acute	90	30.66	11.01	
			Asthma	40	24.37	8.69	

Table 4. Mean values of subscales scores and correlation coefficients of subscale scores with FAS, VAS scores. See text for abbreviations

	Scores (mean ± sd)	FAS (r*)	VAS (r*)	Disease	N	SF-36 subscales scores	
						mean ± sd	p-value
PF	51.93 ± 34.98	0.374	0.878	COPD	71	38.10 ± 28.16	< 0.001
				Acute	90	65.89 ± 36.54	
				Asthma	40	44.5 ± 31.72	
RP	43.44 ± 47.61	0.370	0.719	COPD	71	19.72 ± 38.94	< 0.001
				Acute	90	69.44 ± 43.18	
				Asthma	40	26.88 ± 42.88	
RE	76.73 ± 40.89	0.143	0.361	COPD	71	71.36 ± 44.47	0.004
				Acute	90	86.66 ± 32.30	
				Asthma	40	63.33 ± 47.01	
V	50.00 ± 22.70	0.371	0.713	COPD	71	41.76 ± 19.84	< 0.001
				Acute	90	59.06 ± 23.35	
				Asthma	40	43.75 ± 18.52	
MH	59.23 ± 18.92	0.219	0.319	COPD	71	57.13 ± 20.00	0.129
				Acute	90	62.09 ± 17.82	
				Asthma	40	56.00 ± 18.80	
SF	67.82 ± 32.31	0.301	0.749	COPD	71	57.31 ± 31.19	< 0.001
				Acute	90	80.63 ± 29.00	
				Asthma	40	52.18 ± 29.80	
BP	73.00 ± 28.25	0.323	0.595	COPD	71	70.66 ± 27.81	0.004
				Acute	90	82.27 ± 24.74	
				Asthma	40	55.62 ± 28.12	
GH	41.36 ± 29.27	0.414	0.810	COPD	71	27.46 ± 22.05	< 0.001
				Acute	90	59.11 ± 28.64	
				Asthma	40	25.00 ± 16.36	

*All correlations were statistically significant

health status and disability. This is a constant finding according to the literature indicating that there is a strong relationship between household income and COPD prevalence [2, 16, 17]. Additionally, the low income is strongly related with the prevalence of several chronic diseases and less access to the healthcare services [18–20]. In general, COPD patients and persons suffering from other chronic respiratory diseases are not able to afford the cost of daily living. They report a lower health status level and face several barriers to access to health services and experience difficulties covering the related expenses [21, 22]. This group of patients remains the most vulnerable since the beginning of the economic crisis in terms of access to care [23, 24]. Besides, the copayment of pharmaceutical cost make them more helpless [25, 26].

Although this is not a relatively new finding, to our knowledge, this is the first study con-

ducted in a sample of patients, which has used a validated scale to explore the perceived ability of the patients to cover their daily expenses. This “new” profile of the COPD patients raises a major concern about their vulnerability to the increasing austerity measure in Greece. The most vulnerable patients (confined to bed, unable to wash or dress themselves, unable to perform their usual activities, those with extreme pain or discomfort, anxiety or depression) reported the worst financial ability. According to the latest (22.06.18) report of the Hellenic Statistical Authority (ELSTAT) that presents the results of the 2017 Survey on Income and Living Conditions of households, with the year 2016 as the reference income period, persons at risk of poverty or social exclusion represent 34.8% of the total population (3,701,800 persons). The at-risk-of-poverty rate or social exclusion for persons aged 65 and

over amounts to 22.8% (25.1% for women and to 19.9% for men). It is well documented that those > 65 years old are more at risk of poverty due to a huge decrease of their pensions, and as a result of their income, and a relatively high increase of their needs due to their comorbidities [26, 27].

Taking into account these statistics and the fact that these patients with a chronic respiratory disease cannot afford to have a housekeeper or to cover the expenses for other therapies (Table 3), we conclude that there is an urgent need to re-engineer the governmental policy for providing quality community care to that category of patients [13]. The hospitalization of these persons (who are more likely to be hospitalized) is also a challenge [28] as it still remains a unique opportunity to re-assess their social and financial needs by using a validated tool and take measures to overcome the barrier to their treatment and daily care after their discharge.

Given the severe austerity in Greece over the last decade, the patients who suffer from chronic respiratory diseases have “prioritized” their household activities, meaning that they are not able to have a housekeeper, save money, share the expenses of their relatives, buy clothes or spend money for entertainment. On the contrary, they try to keep their money in order to buy basic goods and to spend them for heating and paying their bills and taxation.

Limitations

A limitation of the current study could be the small sample and its geographical distribution, although the sample consisted of patients who suffered from respiratory diseases and were hospitalized in a hospital that covers a large amount of the population in central Greece. This could limit generalization of the main results to the population.

Conclusions

In the era of economic crisis, austerity measures in Greece affected COPD burden in terms of financial ability and the quality of life.

Conflict of interest

The authors declare no conflict of interest.

References:

- Blanco I, Diego I, Bueno P, et al. Geographical distribution of COPD prevalence in Europe, estimated by an inverse distance weighting interpolation technique. *Int J Chron Obstruct Pulmon Dis.* 2018; 13: 57–67, doi: [10.2147/COPD.S150853](https://doi.org/10.2147/COPD.S150853), indexed in Pubmed: [29317811](https://pubmed.ncbi.nlm.nih.gov/29317811/).
- Yin P, Zhang M, Li Y, et al. Prevalence of COPD and its association with socioeconomic status in China: findings from China Chronic Disease Risk Factor Surveillance 2007. *BMC Public Health.* 2011; 11: 586, doi: [10.1186/1471-2458-11-586](https://doi.org/10.1186/1471-2458-11-586), indexed in Pubmed: [21781320](https://pubmed.ncbi.nlm.nih.gov/21781320/).
- Grigsby M, Siddharthan T, Chowdhury MAh, et al. Socioeconomic status and COPD among low- and middle-income countries. *Int J Chron Obstruct Pulmon Dis.* 2016; 11: 2497–2507, doi: [10.2147/COPD.S111145](https://doi.org/10.2147/COPD.S111145), indexed in Pubmed: [27785006](https://pubmed.ncbi.nlm.nih.gov/27785006/).
- Jones PW, Gelhorn H, Wilson H, et al. Socioeconomic status as a determinant of health status treatment response in COPD trials. *Chronic Obstr Pulm Dis.* 2017; 4(2): 150–158, doi: [10.15326/jcopdf.4.2.2017.0132](https://doi.org/10.15326/jcopdf.4.2.2017.0132), indexed in Pubmed: [28848924](https://pubmed.ncbi.nlm.nih.gov/28848924/).
- Yfantopoulos J. The Greek version of the EuroQol (EQ-5D) instrument. *Archives of Hellenic Medicine.* 2001; 18(2): 180–191.
- Pappa E, Kontodimopoulos N, Niakas D. Validating and norming of the Greek SF-36 Health Survey. *Qual Life Res.* 2005; 14(5): 1433–1438, indexed in Pubmed: [16047519](https://pubmed.ncbi.nlm.nih.gov/16047519/).
- Carr-Hill RA. EuroQol Group. EuroQol — a new facility for the measurement of health-related quality of life. *Health Policy.* 1990; 16(3): 199–208, indexed in Pubmed: [10109801](https://pubmed.ncbi.nlm.nih.gov/10109801/).
- Minas M, Hatzoglou C, Karetsi E, et al. COPD prevalence and the differences between newly and previously diagnosed COPD patients in a spirometry program. *Prim Care Respir J.* 2010; 19(4): 363–370, doi: [10.4104/pcrj.2010.00034](https://doi.org/10.4104/pcrj.2010.00034), indexed in Pubmed: [20532466](https://pubmed.ncbi.nlm.nih.gov/20532466/).
- Papaioannou AI, Bania E, Alexopoulos EC, et al. Sex discrepancies in COPD patients and burden of the disease in females: a nationwide study in Greece (Greek Obstructive Lung Disease Epidemiology and health ecoNomics: GOLDEN study). *Int J Chron Obstruct Pulmon Dis.* 2014; 9: 203–213, doi: [10.2147/COPD.S52500](https://doi.org/10.2147/COPD.S52500), indexed in Pubmed: [24600217](https://pubmed.ncbi.nlm.nih.gov/24600217/).
- Mitsiki E, Bania E, Varounis C, et al. Characteristics of prevalent and new COPD cases in Greece: the GOLDEN study. *Int J Chron Obstruct Pulmon Dis.* 2015; 10: 1371–1382, doi: [10.2147/COPD.S81468](https://doi.org/10.2147/COPD.S81468), indexed in Pubmed: [26229456](https://pubmed.ncbi.nlm.nih.gov/26229456/).
- Alexopoulos, E.C., Malli, F., Mitsiki, E. Frequency and risk factors of COPD exacerbations and hospitalizations: a nationwide study in Greece (Greek Obstructive Lung Disease Epidemiology and health ecoNomics: GOLDEN study), *Int J Chron Obstruct Pulmon Dis.* 2015; 10: 2665–2674.
- Kotsiou OS, Zouridis S, Kosmopoulos M, et al. Impact of the financial crisis on COPD burden: Greece as a case study. *Eur Respir Rev.* 2018; 27(147), doi: [10.1183/16000617.0106-2017](https://doi.org/10.1183/16000617.0106-2017), indexed in Pubmed: [29367410](https://pubmed.ncbi.nlm.nih.gov/29367410/).
- Mitonas G, Juvana A, Daniil Z, et al. COPD patients' medical care and support in Greece during financial crisis. *Int J Gen Med.* 2016; 9: 401–407, doi: [10.2147/IJGM.S105965](https://doi.org/10.2147/IJGM.S105965), indexed in Pubmed: [27877063](https://pubmed.ncbi.nlm.nih.gov/27877063/).
- Tzanakis N, Anagnostopoulou U, Filaditaki V, et al. COPD group of the Hellenic Thoracic Society. Prevalence of COPD in Greece. *Chest.* 2004; 125(3): 892–900, doi: [10.1378/chest.125.3.892](https://doi.org/10.1378/chest.125.3.892), indexed in Pubmed: [15006947](https://pubmed.ncbi.nlm.nih.gov/15006947/).
- Sichletidis L, Tsiotsios I, Gavriilidis A, et al. Prevalence of chronic obstructive pulmonary disease and rhinitis in northern Greece. *Respiration.* 2005; 72(3): 270–277, doi: [10.1159/000085368](https://doi.org/10.1159/000085368), indexed in Pubmed: [15942296](https://pubmed.ncbi.nlm.nih.gov/15942296/).
- Kanervisto M, Vasankari T, Laitinen T, et al. Low socioeconomic status is associated with chronic obstructive airway diseases. *Respir Med.* 2011; 105(8): 1140–1146, doi: [10.1016/j.rmed.2011.03.008](https://doi.org/10.1016/j.rmed.2011.03.008), indexed in Pubmed: [21459567](https://pubmed.ncbi.nlm.nih.gov/21459567/).
- Gershon AS, Dolmage TE, Stephenson A, et al. Chronic obstructive pulmonary disease and socioeconomic status: a systematic review. *COPD.* 2012; 9(3): 216–226, doi: [10.3109/15412555.2011.648030](https://doi.org/10.3109/15412555.2011.648030), indexed in Pubmed: [22497534](https://pubmed.ncbi.nlm.nih.gov/22497534/).
- Kington RS, Smith JP. Socioeconomic status and racial and ethnic differences in functional status associated with chronic diseases. *Am J Public Health.* 1997; 87(5): 805–810, doi: [10.2105/ajph.87.5.805](https://doi.org/10.2105/ajph.87.5.805), indexed in Pubmed: [9184510](https://pubmed.ncbi.nlm.nih.gov/9184510/).
- Sudore RL, Mehta KM, Simonsick EM, et al. Limited literacy in older people and disparities in health and healthcare access. *J Am Geriatr Soc.* 2006; 54(5): 770–776, doi: [10.1111/j.1532-5415.2006.00691.x](https://doi.org/10.1111/j.1532-5415.2006.00691.x), indexed in Pubmed: [16696742](https://pubmed.ncbi.nlm.nih.gov/16696742/).

20. Devoe JE, Baez A, Angier H, et al. Insurance + access not equal to health care: typology of barriers to health care access for low-income families. *Ann Fam Med*. 2007; 5(6): 511–518, doi: [10.1370/afm.748](https://doi.org/10.1370/afm.748), indexed in Pubmed: [18025488](https://pubmed.ncbi.nlm.nih.gov/18025488/).
21. Tsiligianni I, Kocks J, Tzanakis N, et al. Factors that influence disease-specific quality of life or health status in patients with COPD: a review and meta-analysis of Pearson correlations. *Prim Care Respir J*. 2011; 20(3): 257–268, doi: [10.4104/pcrj.2011.00029](https://doi.org/10.4104/pcrj.2011.00029), indexed in Pubmed: [21472192](https://pubmed.ncbi.nlm.nih.gov/21472192/).
22. Kwon HY, Kim E. Factors contributing to quality of life in COPD patients in South Korea. *Int J Chron Obstruct Pulmon Dis*. 2016; 11: 103–109, doi: [10.2147/COPD.S90566](https://doi.org/10.2147/COPD.S90566), indexed in Pubmed: [26834467](https://pubmed.ncbi.nlm.nih.gov/26834467/).
23. Kyriopoulos II, Zavras D, Skroumpelos A, et al. Barriers in access to healthcare services for chronic patients in times of austerity: an empirical approach in Greece. *Int J Equity Health*. 2014; 13: 54, doi: [10.1186/1475-9276-13-54](https://doi.org/10.1186/1475-9276-13-54), indexed in Pubmed: [25062725](https://pubmed.ncbi.nlm.nih.gov/25062725/).
24. Skroumpelos A, Pavi E, Mylona K, et al. The Impact of Economic Crisis on Chronic Patients' Self-Rated Health, Health Expenditures and Health Services Utilization. *Diseases*. 2014; 2(2): 93–105, doi: [10.3390/diseases2020093](https://doi.org/10.3390/diseases2020093).
25. Souliotis K, Kani C, Papageorgiou M, et al. Using big data to assess prescribing patterns in greece: the case of chronic obstructive pulmonary disease. *PLoS One*. 2016; 11(5): e0154960, doi: [10.1371/journal.pone.0154960](https://doi.org/10.1371/journal.pone.0154960), indexed in Pubmed: [27191724](https://pubmed.ncbi.nlm.nih.gov/27191724/).
26. Stafyla E, Kerenidi T, Gerogianni I, et al. The pharmacological cost of COPD during Greek economic crisis. *Int J Chron Obstruct Pulmon Dis*. 2017; 12: 461–466, doi: [10.2147/COPD.S123095](https://doi.org/10.2147/COPD.S123095), indexed in Pubmed: [28203069](https://pubmed.ncbi.nlm.nih.gov/28203069/).
27. Kentikelenis A, Karanikolos M, Papanicolas I, et al. Health effects of financial crisis: omens of a Greek tragedy. *The Lancet*. 2011; 378(9801): 1457–1458, doi: [10.1016/s0140-6736\(11\)61556-0](https://doi.org/10.1016/s0140-6736(11)61556-0).
28. Eisner MD, Blanc PD, Omachi TA, et al. Socioeconomic status, race and COPD health outcomes. *J Epidemiol Community Health*. 2011; 65(1): 26–34, doi: [10.1136/jech.2009.089722](https://doi.org/10.1136/jech.2009.089722), indexed in Pubmed: [19854747](https://pubmed.ncbi.nlm.nih.gov/19854747/).