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Full Length Research Paper

Assessment of public awareness on chronic obstructive pulmonary disease in Athens, Greece, and the effects of an awareness-raising national action plan

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Chronic obstructive pulmonary disease (COPD) lacks public recognition despite its high prevalence. Given the absence of an awareness assessing disease-specific questionnaire, we developed the 10-item Athens COPD awareness questionnaire (10-ACAQ, with 4 demographic and 6 COPD-oriented questions) in an attempt to assess the level of public awareness on COPD in 2002. Then, a 6-year action plan (2003 to 2008) was designed to raise public awareness, which consisted of publishing relevant articles in newspapers/magazines, interviews/presentations in TV/radio, talking to public and educating primary care physicians. With the use of 10-ACAQ, we evaluated the impact of our action plan on raising public awareness during the World COPD days of 2005, 2007 and 2008. In 2002, 228 subjects completed the 10-ACAQ. 47% had heard about the disease but only 13% was really aware of COPD. In 2005, 2007 and 2008, the 10-ACAQ was administered to 298, 239 and 258 citizens respectively. The level of public knowledge on COPD increased significantly from 13% (2002) to 29, 45 and 55% respectively ($p<0.001$). In conclusion, substantial improvement in public awareness level on COPD has been accomplished through a continuum of activities targeting mass media and primary care physicians. The 10-ACAQ appears to be an easy-to-use and valid questionnaire to evaluate public knowledge on COPD.

Key words: Chronic obstructive pulmonary disease (COPD), public awareness, COPD awareness questionnaire.

INTRODUCTION

Chronic obstructive pulmonary disease (COPD) is the most common smoking-induced lung disease and is the 4th leading cause of deaths worldwide, projected to 3rd rank by 2020. Despite these figures, there is a substantial lack of public awareness and knowledge on COPD among general population, population at risk (smokers) and even population of COPD patients themselves or health care professionals (Mannino et al., 2000, 2002). The Global Initiative for Chronic Obstructive Lung Disease (GOLD) was created with the aim, among others, to increase awareness of COPD among health professionals, public health authorities and the general public (Pauwels et al., 2001). Despite concerted worldwide effort, the level of awareness on smoking hazards or more specifically on COPD, has been elucidated by various investigators and it has been found consistently low in different parts of the world (Bachmann et al., 2007; Jarrold et al., 2009; Power et al., 2004; Lyna et al., 2002; Halpern-Felsher et al., 2004; Oncken et al., 2005). Impressively, the level of education or even the medical experience, does not seem to affect the public ignorance on smoking or on COPD. This absence of awareness is followed by obvious consequences,

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Abbreviations: COPD, Chronic obstructive pulmonary disease; **10-ACAQ,** 10-item Athens COPD awareness questionnaire.

such as under diagnosis or delayed diagnosis of this disease, which, in turn, leads to delayed application of preventive (smoking cessation, vaccination) and therapeutic (pharmacothe-rapy, rehabilitation, etc.) strategies. Another problem regarding the assessment of public awareness is the absence of a valid measuring tool. There is a need for a reliable instrument to estimate public awareness concerning COPD.

In our Greek population-based national study of the epidemiology of COPD, it has been shown that the average prevalence of COPD in people > 35 years old with a smoking history of > 100 cigarettes per lifetime is 8.4% (Tzanakis et al., 2004). Overall, mild COPD was more common than severe COPD in both males and females; 58% of the studied subjects had mild COPD, 26% had moderate COPD and the remaining 16% had severe COPD. A very important finding was that in the group with mild COPD, only 18.6% of patients already knew that they had the disease.

Hence, the aim of our study was summarized in two parts: firstly, to develop an appropriate COPD awareness questionnaire and to assess the current level of knowledge on COPD in the general population by using that specific instrument, and secondly, to design and implement a nationwide awareness-raising plan and to measure the efficacy of our efforts to raise public awareness on this debilitating chronic disease.

METHODS

In order to assess the level of knowledge on COPD, a 10-item questionnaire which was named as the 10-item Athens COPD awareness questionnaire (10-ACAQ), was developed by two authorized members (ENK, NT) of the COPD Scientific Group of Hellenic Thoracic Society. It was evaluated and approved by a Committee of the Hellenic Thoracic Society (MT, OA, NMS - Nr. Appr/HTS.: 212/10-09-2002). The Committee found the questionnaire appropriate to be administered to the general non-patient population and suitable to estimate the level of public awareness on COPD, its risk factors and symptoms. Before its use, the questionnaire 10-ACAQ was validated in a cohort of 58 healthy subjects of age ranging from 21 to 77 years old. It was administered on 2 different occasions and it was found reproducible with an intra-subject variability from 0 to 10% (1 question) and easily applicable with a mean duration of completion of approximately 5 min.

The questionnaire, consisting of 4 demographic questions and 6 questions regarding awareness and knowledge on COPD, is shown in Table 1. Subjects who heard of COPD, were considered as really aware only if they had ticked “chronic bronchitis/emphysema” in question #7, two out of the 3 more common symptoms of COPD (shortness of breath, cough, phlegm) in question #8 and “smoking” as the major risk factor in question #9.

In the first step and to assess the current level of knowledge on COPD, the 10-ACAQ was administered to citizens of Athens, the capital city of Greece, during the activities for the World COPD Day in 2002. Our target group consisted of naïve subjects passing by the most central square of Athens downtown (Syntagma square) who were older than 18 years. Physicians, nurses, subjects working in hospitals and health industry, students of Medicine and Pharmacy, COPD patients and relatives of COPD patients, were all excluded.

After this initial administration of 10-ACAQ, the COPD Scientific Group in the setting of its commitment to raise the level of public knowledge on COPD, decided to develop a 6-year Action Plan (2003 to 2008). This Action Plan consisting of certain activities on a yearly basis (Table 2), focused, firstly, to address adequately, the public awareness through mass media and, secondly, to educate primary care physicians in the way of suspecting, diagnosing and managing COPD.

To evaluate the outcome of this action plan, we decided to administer the 10-ACAQ to Athenian citizens in the same area (Syntagma square) during the World COPD days of 2005 (3 years after the first administration), 2007 (2 years after the second administration) and 2008 (1 year after the third administration).

The Action Plan and the administration of the 10-ACAQ as a tool for population survey were approved by the Board of Hellenic Thoracic Society and the Institutional Ethics Committee. Chi-square test was used for the statistical analysis of the observed alterations in the numbers of subjects who had heard and those who were really aware of COPD. Statistical significance was set as $p<0.05$.

RESULTS

On the first occasion of assessing the level of public knowledge on COPD (World COPD Day, 2002), 228 subjects had answered the administered 10-ACAQ. The results are shown in Table 3 (2002 column). Although the 47% of the subjects had heard the disease, only 13% really knew the disease and some of its important aspects, such as terms, symptoms and the major risk factor. We did not observe any difference in awareness associated with age, gender, smoking habit or the educational level in our sample of population.

We evaluated the outcome of our Action Plan on beating public ignorance on COPD by administering the 10-ACAQ to a comparable sample of naive subjects at the same location, Syntagma square of Athens, during the activities of World COPD Days 2005, 2007, 2008. The results are shown in Table 3 and Figure 1.

The awareness on COPD has increased significantly from 13 (2002) to 55% (2008) (chi-square; $p<0.001$). The subjects’ samples of the specific time points (World COPD Days, 2002, 2005, 2007 and 2008) were not statistically different in terms of number, age, gender and educational level. There is also a pattern of significant increase in the percentage of subjects who have heard of COPD (chi-square test; $p=0.004$). However, this pattern presents two different phases. We observed an initial plateau (2002 to 2005) followed by a curvilinear pattern of increase with an inflection point of increase (after 2005 and towards 2007 and 2008). After 2005 and towards 2007 and 2008, a progressively increasing contribution of information from relatives or friends stated as a new source of information at 2007 and 2008 was observed (Table 3).

DISCUSSION

To our best knowledge, this is the first study investigating the efficacy of a structured long-term campaign aimed at

Table 1. The 10-item Athens COPD awareness questionnaire (10-ACAQ) developed by the COPD Scientific Group of the Hellenic Thoracic Society.

Question	Choice of answer
1. How old are you?	Write your age in years
2. What is your gender?	Male - Female
3. Are you or were you a smoker?	Current smoker - ex-smoker - never smoker
4. What is your educational level?	primary - high school/lyceum - university
5. Have you ever heard the terms “Chronic obstructive pulmonary disease” or “COPD”?	Yes (continue to next questions) No (go to question 10)
6. If yes, from which source?	From mass media (Television, radio, newspapers, magazines) From relatives/friends From a physician
7. Which disease is chronic obstructive pulmonary disease or COPD?	Tick 1 answer Pneumonia Lung cancer Chronic bronchitis/emphysema Bronchial asthma Tuberculosis Pulmonary fibrosis
8. Which are the usual symptoms of COPD?	Tick 2 answers Chest pain Shortness of breath Hemoptysis Fever Cough Phlegm
9. What is the major risk factor for COPD?	Tick 1 answer Stress Smoking Air pollution Nutrition Alcohol consumption
10. Have you ever heard the term “spirometry”?	Yes - No

increasing public awareness of COPD with the aid of a newly proposed questionnaire, such as the 10-item Athens COPD Awareness Questionnaire (10-ACAQ). Using the 10-ACAQ at 2002 for the first time, we observed, as in many other countries, very discouraging results regarding COPD public awareness in Greece. This disappointing observation was a major trigger to design the activities of the public awareness-raising Action Plan (Table 2). The emphasis on mass media presentations and education of non-pulmonologist physicians was based on 10-ACAQ results analysis of 2002, that those are the most important sources of information.

During the forthcoming years (2003 to 2008) a total of 374 national activities were organized and successfully executed by 115 members of the COPD Scientific Group (see acknowledgement and contributor’s list). The most important result of our COPD awareness campaign is that awareness and knowledge on COPD has increased substantially from 13 to 55% within the 6 years (2003 to 2008) of the action plan application.

The public unawareness with respect to COPD is a global problem and it has been demonstrated consistently in various studies worldwide. A recent questionnaire-based study from Switzerland(Bachmann et al., 2007) showed

Table 2. The activities of the 6-year Action Plan designed and executed by the COPD Scientific Group, endorsed by the Hellenic Thoracic Society, and aiming to increase public awareness on COPD.

1. Establishment of an educational network across country (30-40 sessions yearly)
a. COPD lectures in public by pneumonologists members of the COPD Scientific Group b. Screening spirometry of the audience
2. Publications of articles, written for the public, in newspapers/magazines with national circulation (4-5 articles yearly)
3. Interviews and advertisement/spots in health programmes of the major television channels and radio frequencies (8-10 presentations yearly)
4. Education on COPD diagnosis and management in primary care physicians (internists, general practitioners, other specialties that is, cardiologists etc.) across country through lectures and clinical workshops in the setting of National Congresses or scientific activities (usually evening symposia) co-organized by the COPD Scientific Group and National Specialty Societies or local Medical Associations respectively (15-20 activities yearly)
5. "Attacking information" (press-conference, special articles in newspapers/magazines, television special presentations, distribution of about 10000 leaflets/year on COPD to individual citizens but also to offices, banks, various public services etc. in many cities of Greece) during the World COPD Days 2003-2008 and the World Smoking Cessation Day 2006
6. Administration of 10-ACAQ during the activities of World COPD Days of 2005, 2007 and 2008 – Evaluation of the effectiveness of the Action Plan in impacting on public awareness on COPD

that the knowledge of the participants on COPD was low. This was also true concerning three other major clinical conditions, myocardial infarction, stroke and, HIV/AIDS. The data of our study are in accordance with these reports. Our results showed that during the pre-campaign period (2002) about half (47%) of the 10-ACAQ responders have heard about the existence of a disease with that name. However, there was a very low level (13%) of knowledge on important aspects of COPD such as risk factors and symptoms. This observation was true independently of education level as more than 50% of the subjects were classified as highly educated. All the earlier mentioned findings are not surprising given that the worldwide level of public knowledge on COPD goes along with a general ignorance on the harmful effects of cigarette smoking. In general terms, smokers tend to minimize their personal health risk of smoking or may not be aware of the various smoking-related disease risks (Power et al., 2004; Lyna et al., 2002; Halpern-Felsher et al., 2004; Oncken et al., 2005).

In a study from British Lung Foundation (Jarrold et al., 2009), even lower level of public awareness on COPD has been reported in England. Only 14% of the participants had heard of COPD and a lower percentage had an adequate level of knowledge on symptoms of COPD. In the aforementioned study, it was pointed out that knowledge for COPD did not change significantly from 2007 to 2008. The study outlines the importance of elucidating the factors causing poor awareness and the need for the development of a public policy. Our study comes to cover this lack of a carefully designed action plan, aimed at raising public awareness. We planned a 6-year vigorous Action Plan in an attempt to increase rapidly and steadily, this disappointing level of awareness. This ignorance-combating Action Plan was consisted of numerous nationwide live presentations to public followed with spirometry, continuous involvement of media (TV/radio/ newspapers/magazines) with a peak around the World COPD Days 2003 to 2008 and intense education of primary care physicians and non-pulmonologists across the country. It was a difficult task aiming primarily to tackle public ignorance on COPD, and subsequently to improve under diagnosis and poor outcome of this lethal disease (Mannino et al., 2000; Tzanakis et al., 2004).

A national public awareness campaign with different approach was carried out in 7 large French cities with the primary objective to increase people awareness on chronic respiratory diseases, such as asthma and COPD (Collectif Capital Souffle, 2007). The investigators addressed 2 questionnaires (one collecting demographic and respiratory-related data and the second assessing subjects' response to the campaign). Subjects also performed a portable spirometry, measuring the ratio FEV_1/FEV_6. This spirometry-based campaign had a high immediate impact on public awareness; almost 86% of subjects reported that they wanted to know more about respiratory health, 64% said that they would discuss with their physician and 63% confessed that the campaign would encourage them to take their medication. Our campaign was not based on such a lung function measurement because we thought that a more wide intervention was necessary. Our action plan was massive using repetitive involvement of national-wide mass media, lasted longer and included an intense education

Table 3. Results of 10-ACAQ administered during the World COPD Days 2002, 2005, 2007 and 2008.

Variable	2002	2005	2007	2008
Number of participants	228	298	239	258
Gender	**{N (%)}**	**{N (%)}**	**{N (%)}**	**{N (%)}**
M	119 (52)	147 (49)	116 (48.5)	111 (43)
F	109 (48)	151 (51)	123 (51.5)	147 (57)
Age				
<40 yrs	84 (37)	116 (39)	100 (42)	108 (42)
>40 yrs	144 (63)	182 (61)	139 (58)	150 (58)
Smoking				
CS	68 (30)	86 (29)	62 (26)	62 (24)
ES	75 (33)	92 (31)	63 (26)	67 (26)
NS	85 (37)	120 (40)	114 (48)	129 (50)
Education				
PS	18 (8)	21 (7)	24 (10)	21 (8)
HS/L	91 (40)	116 (39)	86 (36)	95 (37)
US-G	119 (52)	161 (54)	129 (54)	142 (55)
Heard of COPD	107 (47)	144 (48)	142 (59)	191 (74)
Aware of COPD	30 (13)	86 (29)	108 (45)	142 (55)
Proportion of knowledge about COPD among those who heard for	30/107 = 28%	86/144 = 60%	108/142 = 76%	142/191 = 74%
Source				
MM (%)	67	66	56	54
RF (%)	0	0	11	20
MD (%)	33	34	33	26
Heard of spirometry {N (%)}	135 (59)	185 (62)	151 (63)	173 (67)

* Results are expressed as absolute numbers and as percentages (in parentheses). M: male; F: female; CS: current smoker; ES: ex-smoker; NS: never smoker; PS: primary school; HS/L: high school/lyceum; US-G: University student or graduate; MM: mass media; RF: relative or friend; MD: physician.

of primary care physicians in COPD early diagnosis using such a simple test as spirometry. However, the French survey demonstrates that a national awareness campaign about chronic respiratory diseases is feasible, especially when it is based on a simple lung function measurement, such as the ratio FEV_1/FEV_6.

Another novel finding of this study is the use of a disease-specific tool to measure public awareness the 10-ACAQ. The structure of questionnaire was designed to estimate not only the level of awareness but also to recognize population's attitudes and directions about the sources of the disease information. It consisted of 10 questions divided in two main parts. The first part, Questions 1 to 4 (Table 1) were seeking demographics relevant to our purpose. Questions 5 to 7 were designed to evaluate directly the level of individual's knowledge about the disease but also to check the main source of the disease information (question 6) used by the participants. The final two questions evaluate the knowledge about the main risk factor (smoking) and the current knowledge on the principal diagnostic test (spirometry).The use of 10-ACAQ allowed us to design our intervention plan by taking into account the initial analysis of the evaluation study of the 10-ACAQ. We succeeded in demonstrating good results in recognizing public attitudes and measuring a remarkable increase in COPD public awareness in Athens between 2002 and 2008. The demographic part of 10-ACAQ helped us see relevant relations such as gender or educational differences. We did not observe any educational or gender-specific difference concerning COPD knowledge. This was a challenge to include in our campaign gender-balanced material information and to emphasize that COPD is not just a disease for males. The need to highlight the fact that COPD equally affects males and females is also a stable finding in several reports as women, particularly

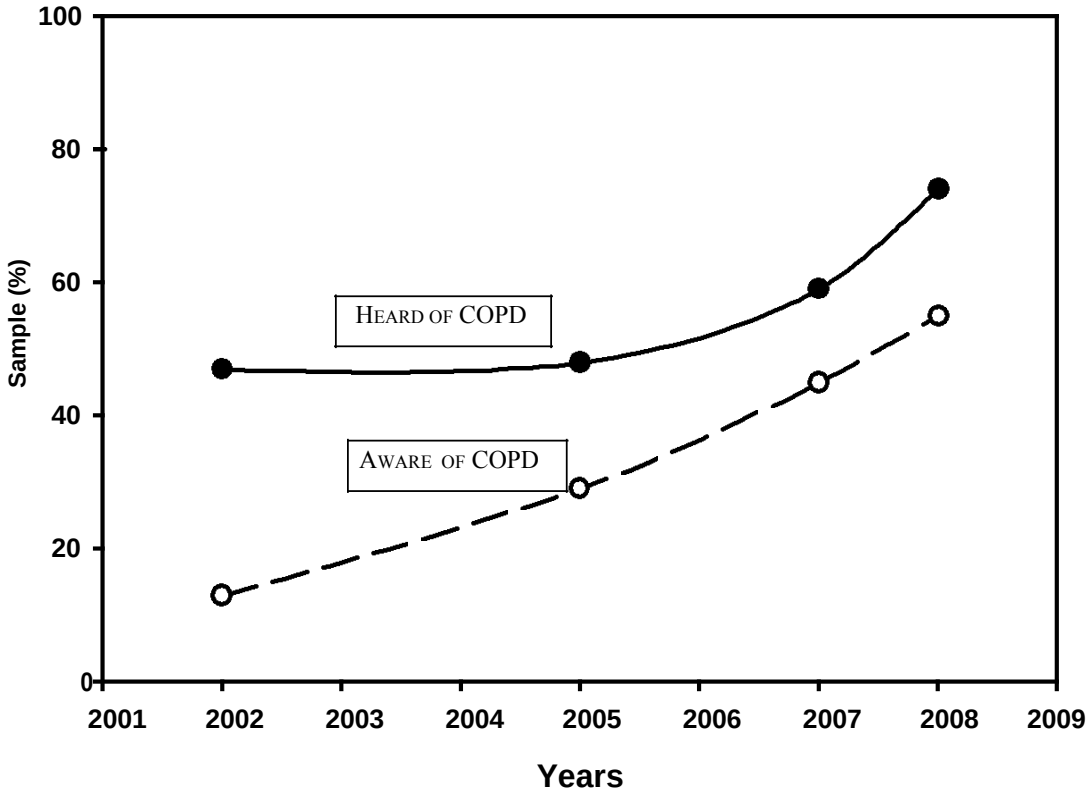

Figure 1. The pattern of increasing public awareness on COPD from 2002 to 2008 is shown. The increase in percentage of subjects "heard of COPD" is depicted with the solid line and the closed circles, while the increase in percentage of subjects "aware of COPD" is depicted with the dashed line and the open circles.

those who smoke, may not adequately be informed, appropriately screened and managed (Pederson et al., 2007). The serial analysis in all time points of the answers in question 6, concerning the information source from which individuals heard of the disease is very interesting (Table 3, Figure 1). Behind the raising awareness level, and with respect to the percentage of people who have "heard COPD", we observed an initial plateau (2002 to 2005) followed by a curvilinear pattern of increase, almost parallel with the linear increase of awareness. There is an obvious inflection point of increase after 2005, which seems to correspond to the progressively increasing contribution of information from relatives or friends (stated as source of information on 2007 and 2008, Table 3), apart from the constant information provided by the other sources, such as mass media and physicians. We may speculate that, importantly, COPD gradually became a topic of social conversation between friends and relatives as a consequence of the long lasting and repetitive campaign. This additional source, added to the traditional sources of doctors and media, corresponds to the late (2007 to 2008) increase in the percentage of people who have heard and are aware of COPD.

Critique in the present study merits the method of sample selection which may introduce a bias in the case that someone could attribute the observations to entire Greek population. The high level of education (52% of the sample were University graduates or students) can be explained by the location of the 10-ACAQ administration (Syntagma square), which is surrounded by Ministries, law offices, the stock market and the commercial center of the city. Thus our results should be interpreted with caution since our random samples of subjects were not well balanced regarding smoking and level of education with the general Greek population. However, we believe that the gradual rise of public awareness observed in this study is true since the estimation was based on the same tool and was applied in the same city and in balanced samples during the time points.

The results of the present study showed that a long-term COPD awareness campaign is demanding, but, with respect to the predictions and anticipations, it is feasible and effective. Its effectiveness is also measurable using disease-specific tools such as the 10-ACAQ used in this study. We may anticipate that the augmentation of public awareness on COPD, will result eventually to a decline in COPD incidence and prevalence, however, this ideal effect has to be addressed in future studies dealing with that specific research question. However, the most important practical component of our campaign was the spirit of collaboration and social offer that characterized

the contribution of the members of our COPD Scientific Group of Hellenic Thoracic Society (see contributors' list).

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All authors contributed substantially to the current study with respect to design, conduction, analysis and writing the manuscript. ENK and NT, as coordinators of the COPD Scientific Group, developed the questionnaire, designed the study, organized the 6-year Action Plan and wrote the manuscript; SD collected/analyzed questionnaire data from 2007 and 2008 and participated in the activities of the Action Plan; KK collected/analyzed questionnaire data from 2002 and 2005 and participated in the activities of the Action Plan; ET and MH collected data and participated in the activities of the Action Plan; OA and MT validated and approved the questionnaire and participated in the activities of the Action Plan; NMS gave his thoughtful assistance with respect to the questionnaire and the Action Plan, validated and approved the questionnaire and gave editorial assistance.

All authors have full access to all of the data and take full responsibility for the integrity and accuracy of the data analysis.

CONTRIBUTORS' LIST

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