Living with chronic obstructive pulmonary disease: A survey of patients’ knowledge and attitudes

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Summary
Introduction: Chronic obstructive pulmonary disease (COPD) is a common respiratory condition and the fourth leading cause of death in Canada. However, little is known about the impact of COPD on the lives and attitudes of individuals living with this condition. The purpose of this study was to determine whether Canadians with COPD are properly educated and supported, and to recommend solutions to any care gaps identified.

Methods: A total of 389 Canadians were surveyed who were 40 years of age and older, physician diagnosed with COPD, and current or former smokers. The telephone survey contained 68 items and took 35 min to complete. COPD severity was classified according to symptom severity using the Medical Research Council (MRC) score.

Results: Respondents tended to overestimate their disease severity and reported substantial symptom burden and psychosocial impact of living with COPD. Most individuals claimed to be well informed about COPD; however, their knowledge was poor in several domains including the causes of COPD, the consequences of inadequate therapy and the management of exacerbations. Family physicians were the main health care providers. A minority of respondents had seen a lung health educator. Only 34% had ever received a written action plan and only 33% had been told how to prevent an exacerbation.
Conclusions: The symptom burden and psychosocial impact of living with COPD is substantial. There are significant gaps in patients’ knowledge about the management of COPD and little contact with lung health educators. Increased use of COPD-specific, self-management education programs may help rectify these care gaps.

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Introduction

Chronic obstructive pulmonary disease (COPD) is a well-characterized chronic lung disease that involves progressive airflow limitation with symptoms of dyspnea, cough and sputum production. The most common cause is cigarette smoking. COPD can impose significant morbidity on individuals and was the fifth leading cause of death in Canadians in 1999 and the fourth leading cause of death in 2003. In Canada, COPD is now more common in women than in men, with the rate of death from COPD among women predicted to overtake that of men in the next few years.

The 2005 Canadian Community Health Survey determined that 4.4% of Canadians 35 years of age and older — nearly 750,000 people — have COPD, based on self-reporting of diagnoses made by health care professionals. The annual direct cost of COPD was estimated in the 2003 Confronting COPD Survey to be $1977.81/person. Fully 52.5% of this cost is due to hospitalization for COPD exacerbations. In addition, the indirect annual cost of COPD was estimated to be $1198.18/person, bringing the total cost per person per year in Canada to $3195.97. Thus, the annual economic burden imposed by COPD on society is in excess of $2.4 billion.

The optimal means of diagnosing COPD and of minimizing its symptoms and exacerbations have been published and disseminated in a series of recent consensus guidelines. The guidelines have also been formatted for easier access and use by family physicians, who are the primary health care providers for COPD in Canada. Furthermore, there has been considerable effort by organizations such as the Canadian Thoracic Society (CTS) to ensure that the guidelines are widely disseminated and implemented. Less is known about the impact of guidelines on narrowing the care gap for patients with COPD; however, one recent physician study in Ontario and Quebec has suggested that significant COPD care gaps remain. It has recently been demonstrated that one cause of COPD care gaps is poor patient knowledge or understanding of their symptoms, warning signs for an exacerbation and actions to be taken.

Thus, a survey was undertaken from November 2006 to February 2007 of a representative sample of Canadians living with COPD. The primary goal was to identify gaps in knowledge and attitudes about COPD and its management among individuals living with COPD. A secondary goal was to identify unmet educational needs that could assist with the improvement of educational programs developed by the Canadian Lung Association (CLA), the CTS, and other key stakeholder groups.

Methods

Study population

A total of 437 Canadians were contacted and invited to complete the survey. They were all 40 years of age and older, reported having been diagnosed by a physician with COPD, chronic bronchitis or emphysema and were current or former smokers. No objective lung function data was available. Three-hundred and eighty-nine individuals (89% response rate) completed the survey. This included 55 who were identified by random digit dialling across Canada and 334 who were selected from an Ipsos-Reid list of households containing individuals who reported prior physician diagnosed COPD, chronic bronchitis or emphysema. Several questions relating to visits with pulmonologists and physiotherapists were addressed only to the individuals who were identified from the Ipsos-Reid list. The overall distribution of those surveyed was weighted to match the Canadian COPD population by age, gender and region using Statistics Canada data from the Canadian Community Health Survey.

Survey questionnaire

The telephone survey contained 68 items and took approximately 35 min to complete. The questionnaire was conceived and written by members of the CTS COPD and Pulmonary Rehabilitation Committee, the CLA and Ipsos-Reid. The survey was conducted from November 20, 2006, to February 11, 2007 by employees of Ipsos-Reid on behalf of the CTS and CLA. Individuals experienced with population-based surveys conducted the telephone interviews from a script to minimize bias due to heterogeneity of multiple interviewers. Although this was the first time the questionnaire was used in a research study, the questionnaire was piloted to ensure that questions and responses were unambiguous to respondents.

The first section of the survey ascertained whether respondents met entry criteria including having been diagnosed with COPD, chronic bronchitis and/or emphysema, were over 40 years of age and had a history of smoking. The rest of the interview probed the survey respondents’ diagnosis and attitudes toward COPD. Many of the questions focused on the individuals’ knowledge level and amount of education received from health care professionals. The information solicited included: the respondents’ understanding of the disease’s impact on their daily lives; their current pharmacotherapy and its perceived effectiveness; the health care providers they had seen in the last year and what routine management or
emergency care actions were undertaken in concert with them; whether the individuals had learned anything more about COPD since their diagnosis and if so from whom; and demographic details such as presence of co-morbidities, amount and frequency of smoking, education level, and employment and income status.

Subjects were classified according to symptom severity using the Medical Research Council (MRC) score based upon their response to questions about breathlessness. An MRC score of 1 was classified as “asymptomatic”, MRC 2 as “mild”, MRC 3 or 4 as “moderate”, and MRC 5 as “severe”. The following questions and responses were used in the interviews. Question: Which of the following best describes how breathless you get? Possible responses: Too breathless to leave home; breathless walking a few minutes, even when walking at my own pace; walk slower than people my own age; breathless hurrying on level ground; breathless only after strenuous exercise. Question: Do you feel breathless when? Possible responses: Sitting or lying still; talking; getting washed or dressed; doing light housework; walking up a flight of stairs; none of these.

For the purpose of this survey a precise definition of a COPD exacerbation was not provided to respondents; rather, respondents were asked questions about “flare-ups” of their lung disease; specifically, an exacerbation was counted if subjects reported a flare-up of their lung disease associated with an increase in symptoms of shortness of breath, cough and/or phlegm lasting for two or more days. Respondents were asked about the frequency in the past year and consequences of flare-ups and whether they had been given any advice, including written action plans, for dealing with these flare-ups.

Survey accuracy and statistical analyses

With a sample of 389 individuals with COPD, the results were considered accurate to within ±4.9 percentage points, 19 times out of 20, compared to the results of a putative survey of the entire Canadian COPD population. The margin of error was larger for specific subgroups within the survey population — for example, the results from a 100-person subgroup would have a margin of error of ±9.8 percentage points, while those from a 50-person subgroup would have a margin of error of ±13.9 percentage points, 19 times out of 20.

Chi-square test was used to test the hypothesis of association between dyspnea severity with respondents’ attitudes towards COPD medications and psychological impact of living with COPD. Unadjusted logistic regression was used to analyze the association between medication use and symptom frequency across the Medical Research Council (MRC) dyspnea scale groups. Medication use (long-acting anticholinergic, LABA/ICS combination, LABA alone, ICS alone and SABA) and symptom frequency during an exacerbation (i.e. increased shortness of breath, increased phlegm or sputum production and increased cough) were each modelled separately as the outcomes. A p value of <0.05 was considered statistically significant. Statistical analyses were performed using SAS software, version 9.1 (SAS Institute Inc., Cary, NC).

Results

Respondents’ demographics

Among the individuals that completed the survey, 30% were from western Canada, 30% from Ontario, 20% from Quebec, and 20% from the Atlantic Provinces. Fifty-two percent of respondents were male and 52% were 65 years of age or older. Forty-one percent reported some post-secondary education as highest education level obtained. At the time of the survey, only 19% were employed outside the home. Fifty-one percent were diagnosed with COPD greater than 5 years before the survey was conducted. Twenty-nine percent were current and 71% former smokers.

COPD severity and symptom impact

All respondents received a prior diagnosis from a physician of COPD (78%), chronic bronchitis (55%) and/or emphysema (41%), with some reporting more than one of the three diagnoses. Subjects reported their perception of their disease severity by responding to the question: Overall, how severe is your condition now? Is it mild, moderate, or severe? Disease severity reported by the respondents was higher when compared to their self-assessment with symptom severity as determined using the MRC dyspnea scale. (Fig. 1). For the purposes of analysis in Fig. 1, MRC 1 (26%) and 2 (30%) were combined and called mild (56%). Patient perception of their disease being completely or well-controlled decreased with symptom severity, dropping from 50% among those mildly symptomatic, 49% moderately symptomatic, and 25% of those severely symptomatic.

Shortness of breath or painful breathing, and limitation of physical activity by symptoms were cited by 55 and 43% of respondents, respectively, as being the “most troubling”
aspect of having the disease. The most frequently reported symptoms to occur "every day" or "most days" included coughing (56%), shortness of breath (55%), bringing up of phlegm or sputum (46%), and being awakened by their symptoms on all or most nights (11%).

Respondents with severe dyspnea were significantly more likely than respondents with less severe dyspnea to report a negative psychological impact of COPD on their lives. (Table 1)

In terms of the impact of COPD on daily activities, 60 and 89% of those with moderate and severe dyspnea, respectively, said that their COPD limited their sports and recreation "a lot," compared with 29 and 37% of those who were asymptomatic or had mild dyspnea, respectively. A similar response pattern by symptom severity was also seen for the impact of COPD on normal physical exertion, housekeeping chores, social activities, family activities, sex life and sleeping. With respect to COPD impact on work, 31% of respondents were retired or unemployed at the time of the survey; of the remainder, 30% reported that COPD kept them from working, highest amongst those with severe dyspnea (68%). Furthermore, 40% of those who were currently working said the disease limited the types or amount of work they could do, and 14% said they had lost days of work in the previous year because of COPD.

No significant differences appeared in a sub-analysis of the patients' responses about the severity of their dyspnea by region of residence. Individuals in Quebec tended to view their condition as being slightly more severe than their counterparts across the country, but they also tended to report feeling more in control of their condition and having more confidence in their treating physicians.

Medical management of COPD

The survey confirmed that the vast majority of health care visits for COPD were with general practitioners (Fig. 2). Respondents with more severe dyspnea were more likely to visit health care professionals. There was an average of 5.7 visits per year to a general practitioner or family physician per respondent. With respect to other health resource utilization related to COPD in the previous 12 months, 21% reported having any hospitalizations; 25% had been to an emergency department; and 21% had an unscheduled visit to a clinic. A minority of respondents had more than one of each type of visit.

Most respondents reported having confidence in their doctors' knowledge of COPD. For example, 88% agreed or strongly agreed with the statement, "My doctor is very knowledgeable about my condition and treatment," while 71% agreed or strongly agreed that, "My doctor teaches me how to manage the ongoing symptoms of my condition." Far fewer reported negative comments about their physicians. For example, 30% agreed or strongly agreed with the statement, "My doctor thinks my condition is my fault," and 20% agreed or strongly agreed that, "My doctor does not understand what it is like to suffer from my condition."

Spirometry was reportedly done in a large proportion of respondents; 80% reported having spirometry as part of their diagnostic work-up, and 67% reported having at least

<table>
<thead>
<tr>
<th>Psychological impact of living with COPD related to dyspnea severity.</th>
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<tbody>
<tr>
<td>'Agree strongly/somewhat'</td>
</tr>
<tr>
<td>Dyspnea severity</td>
</tr>
<tr>
<td>Asymptomatic (n = 105) (%)</td>
</tr>
<tr>
<td>---------------------------------------------------------------</td>
</tr>
<tr>
<td>I often feel sad about having my condition</td>
</tr>
<tr>
<td>I panic or get afraid when I can’t get my breath</td>
</tr>
<tr>
<td>If you have it, you are always suffering</td>
</tr>
<tr>
<td>I often feel guilty about having my condition</td>
</tr>
<tr>
<td>I often worry about having a flare-up when I am away from home</td>
</tr>
<tr>
<td>My cough or breathing is embarrassing in public</td>
</tr>
<tr>
<td>I have a hard time making plans because I never know how I will be feeling</td>
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</table>

*n, number of respondents. The chi square test was used to investigate an association between dyspnea severity (severe versus all other levels of dyspnea severity combined) and responding agree strongly/somewhat for each question. Statistically significant differences are indicated by *p < 0.0001 or #p < 0.05.
one spirometry test in the previous year. Thirty-two percent of respondents with severe dyspnea had spirometry testing several times in the past year, compared with 19% of those with moderate dyspnea, 11% of those with mild dyspnea and 9% of those asymptomatic. Sixty-five percent of respondents reported having a chest radiograph in the previous year; those with severe dyspnea reporting the highest rate, at 77%. Other commonly performed tests reported in the previous year included electrocardiograms (50%), pulse oximetry (50%), arterial blood gases (31%) and computed tomography or magnetic resonance imaging scans (26%).

The survey also probed the frequency of pharmacological and non-pharmaceutical treatment interventions (Fig. 3). The most common non-pharmacological intervention was advice about healthy eating, followed by advice about exercise and smoking cessation. Pulmonary rehabilitation was only recommended to 16% of respondents, but 60% of those individuals actually attended a program.

The most popularly prescribed class of medications was short-acting beta agonists with 69% of respondents reporting their use. This was followed by anticholinergics (61%), the combination of long-acting beta agonists and inhaled corticosteroids (44%), and inhaled corticosteroids alone (19%).

The distribution of inhaled medication by dyspnea severity is shown in Fig. 4. There were statistically significant differences related to dyspnea severity in pattern of use of short-acting beta-agonists and long-acting anticholinergics, but not for other inhaled medications. Fully 83% of patients said they did not use non-prescription medications, while 6% said they used over-the-counter cough and/or cold syrups.

With respect to attitudes towards COPD medications, inhalers were reported as effective by 89% of respondents, and 68% said they always carry their inhaler with them (Table 2). There were concerns expressed about medications, which are potential barriers to patient adherence with taking them as prescribed, particularly among respondents with severe dyspnea. Seventeen percent said they had been prescribed home oxygen, while 30% were not currently using it. Improvement in symptoms was the most commonly offered reason for stopping home oxygen.

Coping with COPD flare-ups

Flare-ups or exacerbations are the most common reason for contact between COPD sufferers and the health care system, and 81% of respondents reported experiencing at least one flare-up in the previous 12 months. In general, frequency of increased symptoms (shortness of breath, cough and/or phlegm) associated with flare-ups were significantly related to MRC dyspnea severity (Fig. 5). Respondents had varied perceptions regarding the nature and causes of exacerbations. For example, 44% reported that their own actions/physiological factors could cause exacerbations of COPD, while 34% felt environmental factors were to blame. Other possible causes of flare-ups provided by respondents included strenuous activity (26%), psychological factors (21%), stress (17%), allergies (17%), smoking (15%), colds (13%), “flu” (5%) and chest infections (4%). Sixteen percent said they did not know what caused flare-ups.

Respondents’ perceptions of the most effective ways to prevent flare-ups were similarly varied and reflected to some extent the perceived causes. For example, 21% said they believed an effective preventive action is to take their prescribed medication, 20% cited smoking cessation, 15%...
said avoiding strenuous activity, and 10% said they believed that avoiding stress was effective. Only 4% reported being careful to avoid infection as a useful prevention strategy. Seventeen percent said they do not know how to prevent flare-ups.

Eighty-three percent of those surveyed said they knew how to cope with flare-ups. However, 64% agreed or strongly agreed with the statement, "I wish I had more information on how to deal with my flare-up." Moreover, many felt they knew how to prevent flare-ups and could easily control them, 35% agreed or strongly agreed with the statements, "I constantly worry about getting a flare-up" and "My doctor hasn't been able to help me reduce [the] severity of my flare-ups." Those with severe COPD reported being significantly more likely to worry about flare-ups and their deleterious consequences than did those with milder disease.

Perceived consequences of a flare-up included 79% of respondents who reported that flare-ups can affect their survival, 71% cited the need for a rescue medication, an unscheduled physician visit (62%), an emergency department visit (57%), admission to hospital (56%), death (46%), and the need for intubation (25%). Eighty percent of respondents reported taking medication when they had a flare-up. Forty-one percent visited their doctor, 26% spoke to their physician on the phone and 19% visited an emergency department. Forty-eight percent of respondents delayed contacting a physician for longer than 1 day after the onset of the flare-up. Thirty-two percent reported that the duration for "time to recovery" from the flare-up was greater than a week.

Despite the awareness among respondents of the serious consequences of flare-ups, they reported having received little education from their physicians about how to self-

**Table 2** Respondents’ attitudes towards COPD medications related to dyspnea severity.

<table>
<thead>
<tr>
<th>Dyspnea severity</th>
<th>Asymptomatic (n = 105) (%)</th>
<th>Mild (n = 121) (%)</th>
<th>Moderate (n = 118) (%)</th>
<th>Severe (n = 45) (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Inhalers are effective in providing relief from symptoms</td>
<td>92</td>
<td>92</td>
<td>83</td>
<td>88</td>
</tr>
<tr>
<td>I always carry an inhaler with me</td>
<td>57</td>
<td>73</td>
<td>68</td>
<td>81</td>
</tr>
<tr>
<td>My current medication schedule makes it difficult to lead an active life</td>
<td>9</td>
<td>21</td>
<td>22</td>
<td>39*#</td>
</tr>
<tr>
<td>I get embarrassed using my medication in public</td>
<td>10</td>
<td>17</td>
<td>20</td>
<td>32*</td>
</tr>
<tr>
<td>My medication does not help me very much</td>
<td>12</td>
<td>18</td>
<td>20</td>
<td>41*</td>
</tr>
<tr>
<td>I have unpleasant side effects from my medication</td>
<td>14</td>
<td>11</td>
<td>20</td>
<td>30*#</td>
</tr>
</tbody>
</table>

n, number of respondents. The chi square test was used to investigate an association between dyspnea severity (severe versus all other levels of dyspnea severity combined) and responding agree strongly/somewhat for each question. Statistically significant differences are indicated by * p < 0.0005 or # p < 0.05.

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**Figure 5** Increasing frequency of symptoms during flare-ups related to symptom severity according to the Medical Research Council (MRC) dyspnea scale. * indicates significant difference in symptom frequency related to symptom severity (p < 0.05).
manage these acute events (Fig. 6) and only a third had a written action plan to follow during a flare-up.

COPD education and public awareness

Only half of respondents felt that COPD was accurately depicted by the media and 37% believed that the public was well educated about the disease. Sixty-three percent agreed that educating the public would decrease the stigma associated with living with COPD.

The vast majority of respondents had a positive picture of their knowledge about COPD. Eighty-nine percent strongly agreed or agreed with the statement, “I feel I am very well informed about how to manage my condition.” Yet, 39% strongly agreed or agreed with the statement, “People with this condition are powerless to control its progression,” while 47% strongly agreed or agreed with the statement, “I feel I am not in control of my breathing problem.” Those with severe disease were significantly more likely than others to strongly agree or agree with these statements.

Overall, respondents were more informed about their COPD at the time of survey than they had been at the time of their diagnosis. Sixty percent indicated that their COPD education came from health care professionals, but only 5% cited a lung health educator as the source. Forty-nine percent cited reading materials and information in the media including the Internet as important COPD-education sources, while 23% cited health organizations such as clinics, hospitals and rehabilitation centres as information sources they used. Another 8% reported that they relied on their own experience and 4% relied on their peers, family, friends and acquaintances. Those with severe dyspnea reported higher rates of information-gathering from clinics, hospitals and rehabilitation centres, and from their own experience.

Discussion

This study is the largest survey ever undertaken in Canada of COPD patients’ perceptions and education regarding their disease, its severity and treatment, and their relationship with health care professionals. As such, this survey complements the recent study of primary care physician COPD management practices in Ontario and Québec.9

This study revealed that the symptom burden and psychosocial impact of living with COPD was substantial, particularly for those with more severe dyspnea. The results also indicated that most individuals with COPD felt well informed about their condition. However, their knowledge was poor about the causes of COPD, the consequences of inadequate therapy and the management of exacerbations. The survey results also confirmed that the vast majority of COPD patients’ contact with the health care system for this disease occurs in the form of visits with their general practitioners or family physicians.

There were a number of potential shortcomings of this study design. The methodology relied on subject self-report and recall during a telephone interview. There was no confirmation of the physician diagnosis of COPD with objective lung function testing, nor attempts to review physician or hospital records. There may also have been a self-selection bias among respondents in spite of efforts to select a population representative of the Canadian population living with COPD. COPD is a complex disease; severity is best characterized using multiple assessment tools (e.g. symptom scores, lung function, exercise capacity, nutritional status, etc.). However, in this study, MRC dyspnea score was used as a surrogate for disease severity as it has been shown to correlate with important clinical outcomes such as quality of life and survival and was the most practical means to assess disease severity in this population-based survey.14,15

It was a surprise that the majority of respondents reported having had spirometry at the time of diagnosis. This conflicts with the general perception that pulmonary function tests are underutilized in Canada, particularly in primary care, to confirm the diagnosis of COPD.16 In the recent CAGE study, only 56% of primary care physicians reported that their COPD patients had ever undergone spirometry testing.9 This discrepancy may be accounted for by a selection bias of respondents coming largely from a pre-existing list of households containing a COPD patient.

In keeping with our current understanding of COPD, symptoms were most troublesome to patients with severe dyspnea as determined by MRC dyspnea scale. We also observed that the cardinal COPD symptoms of shortness of breath, cough and phlegm had important negative impacts on all activities of daily living, quality of life and psychological well-being of respondents, especially for those living with severe dyspnea.

The majority of respondents reported regular use of a number of medications for treatment of COPD, but the pattern of medication use was discordant with current CTS guidelines for COPD management.7 For example, long-acting anticholinergics, inhaled corticosteroids and combination long-acting beta-2-agonist/inhaled corticosteroid medications were over prescribed for patients reporting only mild dyspnea. Similar observations were reported in the CAGE study.9

Non-pharmacological therapies, such as pulmonary rehabilitation and self-management education, have been shown to reduce symptom burden, improve health-related
quality of life, and reduce health resource utilization in COPD.\textsuperscript{17-21} Non-pharmacological therapies were underutilized in the survey population with only 16% referred to pulmonary rehabilitation and only 5% who reported seeing a lung health educator. The reasons for this care gap, whether due to poor physician and patient awareness or lack of availability, were not explored in this study; however, it is known that existing pulmonary rehabilitation programs have a capacity to serve only about 1% of the estimated COPD population in Canada.\textsuperscript{22}

There are major health care costs associated with providing care for COPD in Canada\textsuperscript{23}; respondents reported frequent scheduled and unscheduled visits to physicians, emergency department visits and admissions to hospital, particularly during exacerbations. Exacerbations are costly to patients and the health care system, are the most common reason for medical visit, contribute to accelerated decline in lung function and quality of life, and increased mortality in COPD.\textsuperscript{4} The majority of respondents reported at least one exacerbation in the year prior to the survey. Although at least half of COPD exacerbations are thought to have an infectious etiology,\textsuperscript{6} few respondents recognized this fact or understood the role of avoiding infection as a preventative strategy. Written action plans were used by only a third of respondents to manage exacerbations. Clearly, better patient education regarding the prevention and management of exacerbations is required.

Most respondents relied on their physicians for education about COPD. There was, however, a disturbing discordance between respondents’ perception and the reality of their level of knowledge of COPD. One possible solution is collaborative, self-management education involving patient, family caregivers, primary care physicians, specialists and COPD educators/case managers. At its core, self-management education involves formalized education programs aimed at helping the patient and family improve their knowledge and skills relating to COPD, increasing their self-confidence, and helping them to act decisively and correctly at all stages of the disease, including during exacerbations.\textsuperscript{24,25} Self-management education has been shown to significantly reduce the rate of emergency-room visits and hospitalization due to acute COPD exacerbations.\textsuperscript{17-21} However it is clear that to support widespread self-management education programs in Canada, the existing healthcare delivery system and health professionals’ education will have to be modified.\textsuperscript{24,25}

In the 2005 COPD Report Card produced by the Canadian Lung Association, it was noted that public awareness and media coverage of COPD is low compared to many other chronic diseases in Canada.\textsuperscript{16} Respondents of the current survey made similar comments and noted the negative stigma attached to COPD. Individuals living with COPD are often elderly, frail and socially isolated and need help to effectively advocate for more social supports and health care services. Patient advocacy groups, such as the CLA, need to do more to raise the profile of COPD among the general public, health care administrators and health policy decision makers. Hopefully, more effective advocacy will result in improved access to health care services, such as pulmonary rehabilitation programs and self-management education by lung health educators. Improved utilization of effective interventions will help relieve the substantial psychological and physical symptom burden and narrow the knowledge gap seen in this survey of individuals living with COPD.

Conflict of interest statement

Dr Paul Hernandez has participated on medical advisory boards, conducted continuing health education activities and/or industry-sponsored clinical research trials for the following companies: Abbott, Actelion, Altana, AstraZeneca, Boehringer Ingelheim, Eli Lilly, GlaxoSmithKline, Janssen-Ortho, Merck Frosst, Novartis, Nycomed, Paringenix, Pfizer, Shering, and ZLB Behring. Dr Meyer Balter has participated on medical advisory boards, conducted continuing health education activities and/or industry-sponsored clinical research trials for the following companies: Abbott, AstraZeneca, Bayer, Boehringer-Ingelheim, GlaxoSmithKline, Merck Frosst, Nycomed, and Pfizer. Dr Jean Bourbeau has participated on medical advisory boards, conducted continuing health education activities and/or industry-sponsored clinical research trials for the following companies: Altana, AstraZeneca, Boehringer Ingelheim, GlaxoSmithKline, Novartis, Paringenix, and Pfizer. Dr Rick Hodder has participated on medical advisory boards, conducted continuing health education activities and/or industry-sponsored clinical research trials for the following companies: Altana, AstraZeneca, Boehringer Ingelheim, Eli Lilly, GlaxoSmithKline, Merck Frosst, Novartis, Paringenix, and Pfizer.

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