RESPIRATORY CARE Paper in Press. Published on December 4, 2012 as DOI: 10.4187/respcare.02031

**REVISED VERSION**

**Title**: Respiratory therapists' smoking cessation counselling practices: A comparison between 2005 and 2010

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**Word count (main text only)**: 3346

**Word count (abstract)**: 204

**Number of Tables**: 3

**Key Words**: Respiratory therapists – Counselling – Smoking cessation

**Declaration of interests:** Michèle Tremblay, Jennifer O'Loughlin and Dominic Comtois declare that they have no financial disclosures.

RESPIRATORY CARE Paper in Press. Published on December 4, 2012 as DOI: 10.4187/respcare.02031


## ABSTRACT

### Objective

To assess if smoking cessation counselling practices and related psychosocial characteristics among respiratory therapists (RTs) improved between 2005 and 2010.

### Methods

Data were collected in mailed self-report questionnaires in 2005 and in 2010 in random independent samples of active licensed RTs in Quebec, Canada.

### Results

The response proportion was 67.6% in 2005 and 59.9% in 2010. There were no substantial differences in mean cessation counselling scores according to year of survey. RTs who reported that they had received cessation counselling training during their studies or after their studies (when they were in practice) had statistically significantly better counselling practices for both patients ready and patients not ready to quit than untrained RTs. In addition, their self-efficacy to provide effective counselling was higher and they perceived fewer knowledge-related barriers to cessation. Further, RTs trained after their studies perceived fewer patient-related and time barriers to cessation counselling, and had better knowledge of community resources.

### Conclusion

Although the proportion of RTs trained in smoking cessation counselling during and after studies increased between 2005 and 2010 (from 3% to14% and from 17% to 29% respectively), sustained efforts are needed to increase the number of trained RTs, so that this translates into positive observable changes in counselling practices.

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## Introduction

In industrialized countries, cigarette smoking is widely acknowledged as the most important risk factor for chronic diseases including cardiovascular disease, many types of cancer, as well as chronic respiratory diseases[1] Each year, 37,000 Canadians die from diseases caused by cigarette smoking .[2] Although the prevalence of smoking has declined markedly in the last 20 years, approximately 4.8 million Canadians smoked daily or occasionally in 2010. [3]

There is general consensus among experts in regard to the programs, policies, and laws needed to prevent tobacco use and dependence, to help smokers quit, and to protect non-smokers from exposure to secondhand smoke. This consensus resulted in the Framework Convention on Tobacco Control (FCTC) which was adopted in February 2003[4] and has been ratified in a total of 174 countries including Canada. Adequate treatment of nicotine dependence by health professionals is a cornerstone of the FCTC. In 2004, in response to ratification of the FCTC in Canada, the National Public Health Institute of Quebec (INSPQ) established collaborations with six health professional groups in Quebec, Canada including physicians, pharmacists, dentists, dental hygienists, nurses and respiratory therapists. The objective was to develop interventions and practice aids to optimize smoking cessation counselling offered by these health professionals.

Respiratory therapists (RTs) promote cardiorespiratory health and offer care to persons with respiratory illness including asthma, chronic obstructive pulmonary diseases and lung cancer, which are all highly related to smoking. RTs are therefore in a key position to motivate and support smokers to quit.[5] To guide the development of training and educational interventions for practicing RTs and to enable tracking of cessation counselling practices over time, we first surveyed RTs in Quebec in 2005 to assess their cessation counselling practices, and psychosocial characteristics potentially associated with these practices such as beliefs about cessation counselling, self-efficacy to provide effective counselling, perceived barriers to counselling, and knowledge of community cessation resources.[6] Data were also collected on

preferred training formats.[7] The results showed that, although few RTs reported optimal cessation counselling practices, the majority believed that they have an important role in terms of encouraging smokers to quit, and were interested in professional development to optimize their cessation counselling .[7] Self-efficacy, knowledge of community resources, and cessation training during their studies or after studies (when they were in practice) were associated with providing counselling to smokers who were ready to quit. Belief that cessation counselling is the role of RTs and self-efficacy were associated with counselling among smokers who were not ready to quit.[6]

Following the 2005 survey, the INSPQ, in collaboration with the Ordre professionnel des inhalothérapeutes du Québec (i.e.OPIQ), the RTs professional body with regulatory and educational responsibilities, developed and implemented several training interventions on smoking cessation counselling for practicing RTs. Training interventions included 28 3-hour interactive workshops held in small groups of usually less than 30 participants to allow discussions. During these workshops, which were attended by approximately 700 RTs in 2005-7, many topics were discussed including the importance of addressing tobacco cessation with patients, the benefits of quitting, nicotine dependence, strategies to help motivate smokers to make a quit attempt, strategies to help smokers quit, withdrawal symptoms, pharmacotherapy and resources available in the community to help smokers quit. An illustrated pocket practice aid distributed to all 3,429 RTs in Quebec in 2007 and to new graduates in 2008-9, presented the same type of information and included stickers on community resources to be placed on patients' asthma pumps. Ten articles were published in the OPIQ journal in 2005-9 which dealt with the role of RTs in addressing smoking cessation, tobacco cessation counselling, nicotine dependence and pharmacotherapy. Finally, in 2008, the OPIQ Department of Professional Inspection added three questions on smoking cessation counselling to be asked during inspection visits to assess practice quality among RTs.

In 2010, a second survey was conducted among RTs. The objective of this paper is to assess if smoking cessation counselling practices, or psychosocial characteristics related to cessation counselling improved

between 2005 and 2010 in two independent samples of RTs. In addition, because training during or after studies was associated with providing counselling among smokers who were ready to quit in 2005, and because more intense training was available to practicing RTs between 2005 and 2010, we verified if training was associated with either counselling practices or psychosocial characteristics.

## Method

Data were collected in a repeat independent sample survey design, with the first survey conducted in 2005, and the second in 2010. The sampling frame for both surveys comprised the OPIQ membership list of all active licensed professionals in Quebec, Canada (n=2,944 RTs in 2004, and n= 3,745 in 2009). RTs were eligible to participate in the survey if they had engaged in clinical practice during the three months preceding the survey.

In 2005, a simple random sample of 500 persons was selected from the 2004 list, using a random number generator, with replacement of those who had not provided clinical care in the past 3 months. Data were collected from February to April 2005 in a 143-item, self-administered questionnaire which had been pilot tested for readability, comprehension, and ease of completion by ten RTs. A postcard announcing the study was mailed to each person, followed three days later by a package containing the questionnaire, an addressed stamped return envelope, and an explanatory cover letter. Two additional mailings targeting non-respondents were undertaken two and four weeks later. Questionnaire items were based on our previous work. [8,9,10]

In 2010, a self-administered 142-item questionnaire very similar to the one sent in 2005, was mailed to 600 respiratory therapists randomly selected from the 2009 OPIQ membership list, using the same mail protocol that was used in 2005. Ethics approval was obtained from the McGill University Institutional

Review Board in 2004 and the CHUM (*Centre hospitalier de l'Université de Montréal*) Research Center Ethics Review Committee in 2009.

**Study variables**

**Smoking cessation counselling practices**

On the premise that before offering pragmatic, goal-oriented cessation counselling, health professionals must know their patients' smoking status and their readiness to quit smoking, we created two counselling scores. One score pertained to smokers ready to quit (labelled the "Ready to quit" counselling score) and the other pertained to smokers not ready to quit (labelled the "Not ready to quit" counselling score). [6]

The "Ready to quit" counselling score comprised 10 items: During the past 3 months, for what proportion of your patients who smoked and who were preparing to quit did you: (i) ascertain the number of cigarettes smoked per day? ; (ii) discuss previous quit attempts? ; (iii) discuss withdrawal symptoms?; (iv) discuss worries about cessation?; (v) discuss strategies to quit smoking?; (vi) advise setting a quit date? (vii) ascertain whether the first cigarette smoked is within 30 min of waking up?; (viii) refer to either the telephone helpline *j'Arrête* (I quit), a Web site that helps patients quit, a health professional with expertise in cessation, a smoking cessation center, or smoking cessation resources in the community? (ix) offer an appointment or telephone call 1-2 weeks after the quit date?; and (x) recommend nicotine replacement therapy (gum, patch, or inhaler) or bupropion or varenicline? Response options for each item included (1) few/none, (2) less than half, (3) about half, (4) more than half, and (5) all/almost all. Responses were averaged across the ten items, with higher scores indicating that the participant undertook cessation counselling with more of his/her patients who were ready to quit (in 2005, mean [sd] = 2.4 [1.1]; ]; range = 1-5; in 2010, mean [sd] = 2.3 [1.1]; range = 1-5).

The "Not ready to quit" counselling score comprised seven items: During the past 3 months, for what proportion of your patients who smoked and who were not ready to quit did you: (i) discuss the effects of

smoking on health?; (ii) discuss their perceptions of the pros and cons of smoking?; (iii) discuss their perceptions of the pros and cons of quitting? ; (iv) express concerns about their smoking? ; (v) advise patients to stop smoking?; (vi) discuss the effects of secondhand smoke on the health of relatives and friends? ; and (vii) offer an appointment specifically to discuss quitting? Response options for each item included (1) few/none, (2) less than half, (3) about half, (4) more than half, and (5) all/almost all. Responses were averaged across the seven items with higher scores indicating that the participant undertook cessation counselling with more of his/her patients who were not ready to quit (in 2005, mean [sd] = 2.8 [1.1]; ]; range = 1-5; in 2010, mean [sd] = 2.5 [1.2]; range = 1-5).

In both 2005 and 2010, most participants provided answers for all items comprising the two counselling scores. When more than half of the items for a given score had responses, the score was averaged across items for which there were responses . For participants missing responses for half or more of the items comprising a score, the score was set to missing. In 2005, 3% of the "Ready to quit" and 2% of the "Not ready to quit" scores were set to missing. In 2010, 2% of the "Ready to quit" score and 1% of the "Not ready to quit" score were set to missing.

**Psychosocial characteristics**

We measured four psychosocial characteristics related to smoking cessation counselling, using indicators developed in previous work. [6]Belief that cessation counselling is the role of health professionals was measured in seven items (Cronbach's alpha (i.e., a statistic generally used as a measure of internal consistency or reliability of a psychometric instrument) $\alpha_{2005}$=0.69, $\alpha_{2010}$=0.70), with higher scores indicating stronger agreement. Self-efficacy to provide cessation counselling was measured in five items ($\alpha_{2005}$= $\alpha_{2010}$=0.84) with higher scores indicating increased self-efficacy. Knowledge of resources in the community to which patients could be referred for help was measured in one item. Perception of barriers to cessation counselling was measured in four scales: (a) patient-related barriers were measured in four items ($\alpha_{2005}$= $\alpha_{2010}$=0.84), (b) knowledge-related barriers were measured in four items ($\alpha_{2005}$=0.60,

$\alpha_{2010}$=0.76), (c) resource-related barriers were measured in three items ($\alpha_{2005}$= $\alpha_{2010}$=0.66), and (d) time barriers were measured in one item. Higher scores in each of these four scales indicate more perceived barriers to cessation counselling. For each psychosocial characteristic with more than one item, scores were computed by averaging scores across items. If participants were missing greater than 50% of items in a scale, the score was set to missing. Appendix A on Respiratory Care's website describes specific questionnaire items and the response choices used to measure each psychosocial characteristic.

Exposure to smoking cessation counselling training was measured in three items: (i) Have you ever had any training in smoking cessation counselling during your studies?; (ii) Have you ever had any training in smoking cessation counselling after your studies?; and (iii) In the last five years, did you participate in the workshop for RTs on smoking cessation counselling offered by OPIQ entitled "*Intervenir auprès de vos patients fumeurs: le rôle de l'inhalothérapeute*" (Counselling Smokers: The Role of the RT)?

### Covariates

Covariates included year of survey (2005, 2010), age, sex, current smoking status, characteristics of the RTs' clinical environment including the proportion of patients <18 years old and ≥65 years old, and size of the community in which the RT practiced (rural; small city(<100,000 inhabitants); medium-sized city (100,000-500,000 inhabitants); large city ( >500,000 inhabitants).

### Data analysis

Descriptive statistics were used to characterize and compare the 2005 and 2010 samples.. In a dataset that pooled data across the 2005 and 2010 surveys, we used separate multiple linear regression models to test if each of year of survey, or training during or after studies was associated with each dependent variable. All models included year of survey, age and sex as covariates. Additional covariates varied across models and included variables associated with the dependent variable of interest at $p \leq .25$ in simple linear regression.[11] All analyses were conducted using SPSS software version 16.0 for Windows.

RESPIRATORY CARE Paper in Press. Published on December 4, 2012 as DOI: 10.4187/respcare.02031

## Results

In 2005, the response proportion adjusted for non-eligibility was 67.6% and in 2010, 59.9%. There were no statistically significant differences across years in demographic characteristics or in the proportion that smoked. There were some differences in the distribution of patient age group (<18 years old and ≥ 65 years old) but they were not substantively important (Table 1). The proportion of RTs that reported training during or after studies increased from 3% in 2005 to 14% in 2010 (p value <0.001) and from 17% in 2005 to 29% in 2010 (p value = 0.001) respectively. In 2010, 13% of RTs (n=31) reported that they had received the training provided by OPIQ/INSPQ.

Table 2 shows the mean (standard deviation) scores for each psychosocial characteristic and each cessation counselling score according to year and each of training during and after studies. There were few substantive differences in mean scores according to year of survey with two exceptions. The mean score for patient barriers was 3.9 in 2005 compared to 3.6 in 2010 and the cessation counselling score for patients not ready to quit declined from 2.8 in 2005 to 2.5 in 2010. Similarly, there were few substantive differences in mean scores according to training during studies with two exceptions. The mean score for knowledge barriers was 3.6 among RTs who had not received training during studies compared to 3.2 among those who did. In addition, RTs trained during studies reported more favourable counselling scores for patients ready to quit than those who had not received training during studies (2.6 compared to 2.3). With the exception of resource barriers, scores for psychosocial characteristics and both cessation counselling scores were consistently higher among RTs who had received training after studies compared to those who had not received training after studies.

In general, the multivariable models supported the univariate findings (Table 3). Patient-related barriers were significantly higher in 2005 than in 2010, and the cessation counselling scores for patients not ready to quit were significantly lower in 2010 than in 2005. In addition, after control for covariates, knowledge

of community resources was significantly higher in 2010. Similarly, the multivariable analysis supported the univariate findings that training during studies was inversely associated with the perception of knowledge barriers, and that RTs trained during studies reported more favourable counselling scores for patients ready to quit than those who had not received training during studies. After control for covariates, training during studies was also significantly positively associated with the cessation counselling score for patients not ready to quit and with self-efficacy to provide effective cessation counselling. Again, supporting the univariate findings, training after studies was significantly associated with all the psychosocial characteristics (with the exception of perceived resource barriers) and it was positively associated with both cessation counselling scores in multivariable analyses.

## Discussion

FCTC Article 14 states that "governments shall take effective measures to promote smoking cessation and adequate treatment of tobacco dependence".[12] Integration of brief advice to quit into all healthcare services is an effective approach that has been included in guidelines developed in 2010 to help governments meet their obligations under Article 14.[12]

Over the last 15 years, surveys in several countries have collected data on smoking cessation couselling practices of health professionals including physicians, pharmacists, nurses and dentists.[13-17] Factors associated with counselling practices that are amenable to intervention have also been identified. In general, these surveys report that health professionals are more likely to ask patients about their smoking status and advise them to quit than to assist smokers in quitting, refer them to community resources for help or arrange follow-up. [6, 13-17] However to date there are no studies on cessation counselling practices among RTs, although some authors have advocated for their involvement in smoking cessation. [5,18]

The data presented herein indicate that, with two exceptions, neither the smoking cessation counselling practices of RTs nor their characteristics related to counselling improved between 2005 and 2010. In fact,

cessation counselling practices with patients not ready to quit appear to have declined. Perception of patient-related barriers and knowledge of community resources were the only dependent variables for which we observed statistically significant favourable changes over time.

However, our data suggest important differences in counselling practices according to whether or not RTs received cessation counselling training. Compared to those not trained, RTs who had been trained during or after their studies had statistically significantly better counselling practices for both patients ready and not ready to quit. In addition their self-efficacy to provide effective counselling was higher and they perceived fewer knowledge-related barriers than their untrained counterparts.

RTs trained after their studies while they were treating patients in a clinical milieu, perceived fewer patient-related and time barriers to cessation counselling and had improved knowledge of community resources that might help their patients. It is possible that with accumulating experience working directly with patients affected by tobacco-related illnesses, RTs realize that many of their patients who smoke really do want to quit, thereby influencing their perceptions of barriers as well as their motivation to learn about community resources. The training offered by OPIQ to practicing therapists did in fact incorporate information about community resources, as well as realistic estimates of the time needed for counselling.

Given the positive association between training and cessation counselling, it is encouraging that the proportion of RTs trained during studies increased from 3% to 14% from 2005 to 2010, and that 29% were trained after studies in 2010, compared to 17% in 2005. However the proportion of RTs trained remains low and our data suggest that the increases observed between 2005 and 2010 were not sufficient to translate into observable positive changes in counselling practices over time.

The challenge over the next few years will therefore be to continue and intensify OPIQ's work to increase the number of RTs who are trained to provide cessation counselling. In 2010, in order to make access to

training more accessible to all RTs and especially those working in remote areas, OPIQ updated their training modules developed in 2005-2006 and offered them online. Continuing education credits are offered for this online training, which incorporates three clinical scenarios carefully developed to represent the clinical reality of practicing RTs, depicting discussions between an RT and three smokers with differing degrees of motivation to quit. In addition to training, OPIQ continues to publish at least two articles on smoking every year in their professional journal. Finally, OPIQ has endorsed a joint position statement in 2012 with six other provincial health professional orders concerning the importance of addressing tobacco use and the role that health practitioners have in providing cessation support in the context of their daily practice. In this statement, OPIQ has agreed to i) offer and promote cessation counselling training to their members; ii) offer tools to help RTs support their smoking patients; iii) promote community cessation resources and iv) work collaboratively with CEGEPS (post secondary institutions in Quebec that offera variety of educational programs including the training program for RTs) to include training on smoking and cessation counselling in the RTs program.

**Study limitations**

Limitations of this study include that the data derive from self-reports, so that cessation counselling practices could be overestimated. Selection bias related to nonresponse may limit the generalizability of these findings, but likely does not affect the associations observed between cessation counselling practices and the exposures of interest. The Cronbach's α for several psychosocial characteristics (i.e., beliefs and both knowledge- and resource-related barriers to cessation counselling) were low, which may have resulted in some misclassification. Finally it is not known if or how many respiratory therapists participated in both the 2005 and 2010 surveys.

RESPIRATORY CARE Paper in Press. Published on December 4, 2012 as DOI: 10.4187/respcare.02031

## Conclusion

There were few changes in RTs cessation counselling practices or in the psychosocial characteristics related to counselling between 2005 and 2010. Nevertheless, compared to those not trained, RTs who had been trained during or after their studies had statistically significantly better counselling practices for both patients ready and not ready to quit. Although, it is encouraging that the proportion of therapists trained during or after studies significantly increased between 2005 and 2010, efforts will need to be sustained over the next years so that they translate into observable positive changes in counselling practices over time.

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**Highlights**

- We assessed if smoking cessation counselling among Quebec respiratory therapists (RTs) improved between 2005 and 2010.
- There were no substantive differences in cessation counselling scores according to year of survey.
- RTs trained during or after their studies had better smoking cessation counselling practices.
- In addition, their self-efficacy was higher, and they perceived fewer knowledge-related barriers.
- RTs trained after their studies perceived fewer patient-related and time barriers and had better knowledge of community resources.

**Acknowledgements**

The authors thank Olivier Martin, Gloria Wong, Maude Roy, Valérie Roy and Erika Dugas for their contributions. This project was supported by the Quebec Ministry of Health and Social Services. JOL holds a Canada Research Chair in the early determinants of adult chronic disease.

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RESPIRATORY CARE Paper in Press. Published on December 4, 2012 as DOI: 10.4187/respcare.02031

**Table 1 Comparison of selected characteristics of respiratory therapists in 2005 and 2010, Quebec, Canada**

| | Total (n=534) | 2005 (n=294) | 2010 (n=240) | *P*[*] |
|---|---|---|---|---|
| Female,% | 86 | 84 | 88 | .20 |
| Age, mean (sd) | 37.8 (9.9) | 37.8 (9.3) | 37.7 (10.6) | .85 |
| Community type, %[†] | | | | .53 |
| Rural | 8 | 8 | 8 | |
| Small city (<100,000) | 26 | 25 | 28 | |
| Medium-sized city (100,000-500,000) | 30 | 33 | 27 | |
| Large city (>500,000) | 36 | 35 | 38 | |
| Proportion of patients aged <18 years, mean (sd) | 12 (18) | 13 (18) | 10 (18) | .02 |
| Proportion of patients aged ≥65 years, mean(sd) | 61 (24) | 68 (22) | 53 (25) | <.001 |
| Smoker,% | 10 | 12 | 9 | .25 |
| Trained during studies, % | 8 | 3 | 14 | <.001 |
| Trained after studies, % | 23 | 17 | 29 | .001 |

[*] Differences between proportions were tested in chi-square analysis. Differences between means were tested using t-tests.

[†] Totals may exceed 100% due to rounding

RESPIRATORY CARE Paper in Press. Published on December 4, 2012 as DOI: 10.4187/respcare.02031

**Table 2 Mean (sd) score* for psychosocial characteristics and mean cessation counselling score among respiratory therapists according to year of survey, training during and after studies, Quebec, Canada**

| | n | Psychosocial characteristic | | | | | | | Counseling score | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | Beliefs x (sd) | Self-efficacy x (sd) | Knowledge of community resources x (sd) | Barriers | | | | Patients ready to quit x (sd) | Patients not ready to quit x (sd) |
| | | | | | Patient barriers x (sd) | Knowledge barriers x (sd) | Resource barriers x (sd) | Time barriers x (sd) | | |
| **Year** | | | | | | | | | | |
| 2005 | 294 | 4.2 (.5) | 3.5 (.8) | 3.1 (1.1) | 3.9 (.7) | 3.6 (.6) | 3.7 (.7) | 4.3 (.9) | 2.4 (1.1) | 2.8 (1.1) |
| 2010 | 239 | 4.2 (.5) | 3.5 (.8) | 3.2 (1.1) | 3.6 (.7) | 3.5 (.8) | 3.6 (.8) | 4.1 (1.0) | 2.3 (1.1) | 2.5 (1.2) |
| **Training during studies** | | | | | | | | | | |
| No | 454 | 4.2 (.5) | 3.4 (.8) | 3.1 (1.1) | 3.8 (.7) | 3.6 (.7) | 3.6 (.7) | 4.2 (.9) | 2.3 (1.1) | 2.6 (1.1) |
| Yes | 39 | 4.2 (.5) | 3.6 (.7) | 3.2 (1.2) | 3.6 (.6) | 3.2 (.8) | 3.4 (1.0) | 4.3 (.8) | 2.6 (1.1) | 2.7 (1.1) |
| **Training after studies** | | | | | | | | | | |
| No | 403 | 4.1 (.5) | 3.3 (.7) | 2.9 (1.1) | 3.8 (.7) | 3.6 (.6) | 3.6 (.8) | 4.3 (.9) | 2.1 (1.0) | 2.5 (1.1) |
| Yes | 117 | 4.4 (.4) | 4.1 (.7) | 4.0 (1.0) | 3.5 (.8) | 3.3 (.8) | 3.5 (.8) | 3.9 (1.1) | 3.2 (1.1) | 3.2 (1.1) |

*Scores range from 1 to 5; higher values are more favourable except for the barrier scores, for which lower values are more favourable

RESPIRATORY CARE Paper in Press. Published on December 4, 2012 as DOI: 10.4187/respcare.02031

**Table 3. Unstandardized beta coefficients and confidence intervals for the association between year of survey, training during studies and training after studies and each psychosocial characteristic and cessation counseling score among respiratory therapists, Quebec, Canada**

| | Psychosocial characteristic | | | | | | | Counseling score | |
|---|---|---|---|---|---|---|---|---|---|
| | Beliefs β (CI)[*,†,‡,§] | Self-efficacy β (CI), [†,‡]§ | Knowledge of community resources β (CI) [†,‡,§] | Barriers | | | | Patients ready to quit β (CI)[*,,†,‡,§] | Patients not ready to quit β (CI)[*,,†,‡§] |
| | | | | Patient barriers β (CI) | Knowledge barriers β (CI)[*,‡] | Resource barriers β (CI)[‡] | Time barriers β (CI) | | |
| **Year** | | | | | | | | | |
| 2005 | Ref | ref | ref | ref | ref | ref | ref | ref | ref |
| 2010 | -.02 (-.11;.07) | .08 (-.07;.22) | .24 (.03;.45) | -.24 (-.36;-.11) | -.09 (.21;.03) | -.06 (-.19;.08) | -.12 (-28;.05) | -.06 (-.27;.14) | -.28 (-.49;-.07) |
| *p* | .72 | .30 | .02 | <.001 | .12 | .42 | .16 | .54 | .010 |
| **Training during studies** | | | | | | | | | |
| No | ref | ref | ref | ref | ref | ref | ref | ref | ref |
| Yes | .09 (-.08;.24) | .29 (.03;.55) | .32 (-.07;.70) | -.03 (-.28;.21) | -.35 (-.58;-.12) | -.21 (-.47;.06) | .09 (-23;.41) | .56 (.20;.92) | .41 (.03;.79) |
| *p* | .30 | .03 | .10 | .78 | .003 | .13 | .59 | .002 | .03 |
| **Training after studies** | | | | | | | | | |
| No | ref | ref | ref | ref | ref | ref | ref | ref | ref |
| Yes | .29 (.18;.39) | .64 (.48;.81) | .93 (.69;1.16) | -.23 (-.38;-.07) | -.32 (-.47;-.17) | -.09 (-.26;.08) | -.32 (-.52;-.12) | .97 (.74;1.19) | .61 (.37;.86) |
| *p* | <.001 | <.001 | <.001 | .004 | <.001 | .30 | .002 | <.001 | <.001 |

All models included year of survey, age and sex. In addition, variables associated with the outcomes at $p \leq .25$ in simple linear regression were included as follows:

[*] Participant smokes

[†] Participant practices in an urban setting

[‡] Proportion of participant's patients aged <18 years

[§] Proportion of participant's patients aged ≥65 years

RESPIRATORY CARE Paper in Press. Published on December 4, 2012 as DOI: 10.4187/respcare.02031

## Appendix A Questionnaire items used to measure psychosocial characteristics

**Beliefs about the role of the Respiratory therapist (RT)**

Indicate your level of agreement with each of the following: (i) Counselling by a RT helps motivate smokers to quit; (ii) Counselling patients about quitting smoking is an interesting activity; (iii) Nicotine gum and patch, and Zyban (bupropion), should be reimbursed through prescription drug insurance plans; (iv) RTs should advise their patients to quit smoking; (v) RTs should know about resources available in the community to help patients quit; (vi) RTs should make appointments with their patients who smoke; (vii) RTs should ask their patients if they smoke.

Response categories included strongly disagree (1), disagree (2), neither agree nor disagree (3), agree (4), and strongly agree (5).

**Self-efficacy**

Indicate your level of agreement with each of the following: (i) I have the skills to help my patients quit smoking; (ii) I am able to tailor smoking cessation counselling to the specific needs of my patients; (iii) It is easy for me to initiate a discussion about cessation with my patients; (iv) I am able to ascertain the level of addiction of my patients; (v) I think that I can influence my patients to quit smoking.

Response categories included strongly disagree (1), disagree (2), neither agree nor disagree (3), agree (4), and strongly agree (5).

**Knowledge of available resources to refer to**

Indicate your level of agreement with each of the following: I know which resources to refer my patients to, to help them quit.

Response categories included strongly disagree (1), disagree (2), neither agree nor disagree (3), agree (4), and strongly agree (5).

**Patient-related barriers**

There are many reasons why a health professional may not offer cessation counselling. Please rate the importance of the following possible barriers to cessation counselling in your practice: (i) Patients are not interested; (ii) Patients are resistant to advice; (iii) Lack of impact on patients; (iv) Patients do not comply.

Response categories included not at all important (1), not too important (2), moderately important (3), very important (4) and extremely important (5).

RESPIRATORY CARE Paper in Press. Published on December 4, 2012 as DOI: 10.4187/respcare.02031

**Knowledge-related barriers**

There are many reasons why a RT may not offer cessation counselling. Please rate the importance of the following possible barriers to cessation counselling in your practice: (i) Difficult to assess patients' readiness to quit; (ii) Lack of knowledge about smoking cessation counselling; (iii) Lack of knowledge about medication for smoking cessation; (iv) Smoking cessation guidelines are too complex.

Response categories included not at all important (1), not too important (2), moderately important (3), very important (4) and extremely important (5).

**Resource-related barriers**

There are many reasons why a RT may not offer cessation counselling. Please rate the importance of the following possible barriers to cessation counselling in your practice: (i) Lack of community resources to which patients can be referred; (ii) Lack of patient education material; (iii) Cost of medication.

Response categories included not at all important (1), not too important (2), moderately important (3), very important (4) and extremely important (5).

**Time barriers**

There are many reasons why a RT may not offer cessation counselling. Please rate the importance of the following possible barrier to cessation counselling in your practice: Lack of time.

Response categories included not at all important (1), not too important (2), moderately important (3), very important (4) and extremely important (5).