

Do smokers know how to quit? Knowledge and perceived effectiveness of cessation assistance as predictors of cessation behaviour

D. Hammond¹, P. W. McDonald^{2,3,4}, G. T. Fong^{1,3} & R. Borland⁵

Departments of Psychology¹ and Health Studies, University of Waterloo, Ontario,² Centre for Behavioural Research and Program Evaluation, Canadian Cancer Society/National Cancer Institute of Canada,³ Ontario Tobacco Research Unit, Canada⁴ and VicHealth Centre for Tobacco Control, Anti-Cancer Council of Victoria, Australia⁵

Correspondence to:

David Hammond
Department of Psychology
University of Waterloo
200 University Avenue West
Waterloo
Ontario N2L 3G1
Canada
Tel. 519 886 4567, ext. 3597
Fax: 519 746 8631
E-mail: dhammond@uwaterloo.ca

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ABSTRACT

Aims Despite the existence of effective cessation methods, the vast majority of smokers attempt to quit on their own. To date, there is little evidence to explain the low adoption rates for effective forms of cessation assistance, including pharmaceutical aids. This study sought to assess smokers' awareness and perceived effectiveness of cessation methods and to examine the relationship of this knowledge to cessation behaviour.

Design A random-digit-dial telephone survey (response rate = 76%) with 3-month follow-up was conducted with 616 adult daily smokers in South-Western Ontario, Canada.

Measurements A baseline survey assessed smoking behaviour, as well as smokers' awareness and perceived effectiveness of cessation assistance. A follow-up survey measured changes in smoking behaviour and adoption of cessation assistance at 3 months.

Findings Participants demonstrated a poor recall of cessation methods: 45% of participants did not recall nicotine gum, 33% did not recall the nicotine patch and 57% did not recall bupropion. Also, many participants did not believe that the following cessation methods would increase their likelihood of quitting: nicotine replacement therapies (36%), bupropion (35%), counselling from a health professional (66%) and group counselling/quit programmes (50%). In addition, 78% of smokers indicated that they were just as likely to quit on their own as they were with assistance. Most important, participants who perceived cessation methods to be effective at baseline, were more likely to intend to quit (OR = 1.80, 95% CI: 1.12–2.90), make a quit attempt at follow-up (OR = 1.80, 95% CI: 1.03–3.16) and to adopt cessation assistance when doing so (OR = 3.62, 95% CI: 1.04–12.58).

Conclusions This research suggests that many smokers may be unaware of effective cessation methods and most underestimate their benefit. Further, this lack of knowledge may represent a significant barrier to treatment adoption.

KEYWORDS Cessation, cessation knowledge, effectiveness, smoking, treatment adoption.

INTRODUCTION

Approximately half of smokers attempt to quit each year, yet less than 10% succeed [1,2]. Although effective ces-

sation therapies exist, their public health benefit has been limited because close to 80% of smokers who attempt to quit do so without stop-smoking medications or any other method of assistance [1,3].

The low adoption rate of cessation therapies comes at significant cost to both individual and public health: while fewer than 5% of smokers who attempt to quit smoking without formal cessation methods will remain abstinent after 1 year, tailored self-help materials, behavioural programmes, nicotine replacement therapy (NRT), bupropion and counselling from health professionals all increase the likelihood of long-term abstinence [4–8]. Ultimately, individuals who use formal cessation assistance are more than twice as likely than those who quit on their own to achieve long-term abstinence [3].

Why do most smokers use the least effective methods when trying to quit? Several factors may account for the low adoption rates of cessation assistance. First, the decision to quit on one's own may be a matter of personal preference. For example, most smokers indicate a preference to quit on their own rather than participate in behavioural programmes [9]. Secondly, prior experience might lead smokers to forego methods that they have used previously without success. Thirdly, the low adoption rates may be a product of accessibility. Indeed, the availability and cost of some forms of assistance such as pharmacotherapy can be a strong disincentive to use [10–13].

The adoption of cessation assistance may also be a function of cessation knowledge. For example, smokers may simply be unaware of the available forms of cessation assistance. Indeed, when Canadian smokers were asked recently to recall any tips or advice that might help someone quit smoking, only 14% listed either the nicotine patch or medication such as bupropion, only 2% mentioned nicotine gum, while 16% responded that there was no way to help [14]. Similarly, low adoption rates may be a function of perceived effectiveness: smokers may not believe that available cessation methods increase their chances of quitting. For example, Etter & Perneger [15] found that only 16% of current smokers agreed that NRT products help people to quit smoking.

Cessation knowledge may also have implications for how cessation assistance such as pharmacotherapy is used. A minimum level of understanding may be required for smokers to make decisions concerning the appropriate type of NRT, dose and duration of use. The importance of physician advice to the proper use and effectiveness of NRT remains a source of debate; none the less, the majority of smokers who use over-the-counter (OTC) NRT do so for less than the minimum recommended duration [10,16].

In general, however, the role of cessation knowledge within smoking cessation remains largely unexplored and there is little research to explain the gap between the 'clinical' efficacy of cessation assistance and pharmacotherapy, and the use of these methods among smokers trying to quit.

To this end, the present study sought to assess: (a) smokers' recall and perceived effectiveness of cessation methods; (b) the extent to which these measures of cessation knowledge are associated with intentions to quit at baseline and predict quit attempts and the adoption of cessation assistance at follow-up; and (c) smokers' desire for additional cessation-related information.

MATERIALS AND METHODS

Participants

Participants were 616 adult smokers living in South-Western Ontario, Canada. Adult smokers were defined as individuals 18 years of age or older who had smoked at least 100 cigarettes in their life-time and smoked at least one cigarette per day at the time of the survey. Approximately 57% of the sample was female. Participants reported a mean age of 39.2 [2,14] and 13.5 [2,7] years of formal education. Participants also reported smoking an average of 16.0 [6,8] cigarettes per day and an average of 19.7 [3,13] years as a smoker. Study participants were similar to a representative sample of Canadian smokers from the Canadian Tobacco Monitoring Use Survey [11] on all demographic and smoking status measures with one exception: a greater proportion of study participants were female; however, gender was not associated with any of the predictors in the regression analyses, presented below.

Procedure

Telephone calls were made to randomly selected telephone numbers from a list of households in South-Western Ontario, using a modified Mitofsky–Waksburg technique [17]. Households not containing a daily smoker over the age of 18 were ineligible. The 'most recent birthday' method [18] was used to select participants from households that included more than one eligible individual. Each telephone number was attempted 12 times, at different times of the day (mornings, afternoons and evenings) of both weekdays and weekends before being classified as no answer. A total of 5348 numbers was tried. After eliminating ineligible numbers, including businesses and non-working numbers ($n = 1101$) and households not containing an eligible smoker ($n = 3440$), 14% ($n = 111$) of participants refused or failed to complete the survey and 10% ($n = 80$) were not reached, resulting in an AAPOR#4 response rate of 76% [19].

Baseline interviews were conducted by 27 interviewers using computer-assisted telephone interviewing software (WinCATI Version 4.1, Sawtooth Software),

between 9 October and 11 November 2001. Participants were re-contacted to complete a 3-month follow-up survey between 14 January and 26 February 2002.

Measures

The baseline survey assessed daily cigarette consumption, number of years as a smoker, quitting history and demographic variables (sex, age and education). Intention to quit smoking was measured by asking participants whether they were seriously considering quitting in the next 30 days, 3 months, 6 months, 1 year or not at all. Participants were also asked to what extent they would like 'additional information on how to quit smoking', as well as whether they would like a 'toll-free' number or website address for quitting to appear on cigarette packs. The baseline survey also included the following measures of cessation knowledge.

Recall of cessation methods

Participants were asked to: 'Please list as many different methods, aids, or tips for quitting smoking as you can'. Respondents were prompted to list as many methods as possible. Responses were recorded using a precoded list—any response not appearing on the list was recorded verbatim and coded during data analysis. Unprompted recall was selected to establish a higher threshold for 'awareness' than prompted recall or recognition tasks.

Perceived effectiveness

The survey included questions asking about the general benefit or effectiveness of adopting cessation assistance, as well as questions on the effectiveness of specific methods. First, general effectiveness was assessed by asking respondents: 'in your opinion, is it true that if you really want to quit smoking you'll succeed on your own as well as you would with help?'. Responses were given on a five-point Likert scale, where 1 = 'very false' and 5 = 'very true', with lower values (greater disagreement) associated with greater perceived effectiveness. This measure was analysed as a dichotomous variable, where 0 = no perceived benefit from cessation help (strongly agree-neutral) and 1 = perceived at least some benefit from help (agree/strongly agree). Secondly, participants were asked to rate the effectiveness of four specific cessation methods: nicotine replacement therapy (nicotine gum or the patch), bupropion, advice/brief counselling from a health professional and group counselling or other quit programme. Participants were asked: 'in your opinion, how much does using [cessation method] increase your chances of quitting for 1 year, compared to quitting on your own?'. Responses on each of the four items were

given on a five-point Likert scale. A composite measure of perceived effectiveness was created by summing scores of the four items (Cronbach's alpha = 0.60).

Follow-up survey

The 3-month follow-up survey assessed changes to smoking status, including length of continuous abstinence, quit attempts (any attempt to quit smoking that lasted at least 24 hours) and changes in daily cigarette consumption, as well as the adoption of cessation assistance ('what techniques or methods, if any, did you use to help you quit?'). The order of the questions for both the baseline and follow-up surveys was randomized across participants.

A total of 432 participants completed the 3-month follow-up survey, for a follow-up rate of 70%. There were no significant differences between completers and non-completers on any measure of smoking status, demographic variables, or any explanatory variables, including perceived effectiveness and recall of cessation assistance.

Statistical analysis

Logistic regression analyses were conducted to determine the extent to which the three main independent variables (method awareness, general effectiveness and specific effectiveness) predicted each of three outcomes: intention to quit at baseline (no intention to quit versus intention to quit within 12 months); quit attempts between baseline and 3-month follow-up (no quit attempts versus at least one quit attempt); and the adoption of cessation assistance at follow-up (no formal method versus at least one formal method). All analyses were conducted using SPSS software (version 10.0).

RESULTS

Desire for cessation information

A total of 87% of smokers reported that they wanted additional information on where to get help to quit smoking. Similar proportions also wanted information on how to quit (86%) and the benefits of quitting (85%). In particular, 70% of participants wanted to see a toll-free telephone information line on cigarette packages, while 68% wanted to see a website address on cigarette packs. Participants who wanted additional information on how to quit were less likely to believe in the effectiveness of specific cessation methods ($P < 0.001$) or general cessation assistance ($P < 0.001$), and they were less likely to make a quit attempt at follow-up (OR = 0.62, 95% CI: 0.62–0.86). Desire for additional information on how to quit was unrelated to awareness of cessation methods.

Recall of cessation methods

Participants listed a mean of 3.3 (SD = 1.5) different aids, techniques or methods to quit smoking. Approximately 67% of participants recalled the nicotine patch, 55% recalled nicotine gum and 43% recalled bupropion/Zyban or some form of stop-smoking pill. Approximately 11% listed a cessation or counselling programme, approximately 6% cited behavioural quit techniques such as exercise and cutting back gradually, while less than 5% listed counselling from a doctor or pharmacist. Overall, 20% of respondents failed to cite any form of stop-smoking medication/pharmaceutical aid, while 24% of participants cited at least one cessation method with no evidence of effectiveness (i.e. hypnosis and acupuncture).

Perceived effectiveness cessation assistance

General effectiveness

Approximately 78% of smokers responded that, if motivated to quit, they were as likely to be successful on their own as they were with help. In other words, less than one-quarter of participants were optimistic that cessation assistance would increase their chances of quitting.

Specific effectiveness

When asked to what extent specific forms of cessation assistance would increase their chances of quitting, a significant proportion of participants reported that the following cessation methods would either make no difference or reduce the likelihood of quitting: brief advice from a doctor or other health professional (66%), attending group counselling or quit programmes (50%), nico-

tine replacement therapies (36%) and bupropion (35%). Overall, 14% of participants believed that none of these methods would be effective and only 16% believed all four to be effective. Finally, 85% of participants who believed they were more likely to succeed when quitting on their own than with help (general effectiveness) indicated that at least one specific cessation method would increase their chances of quitting.

Participants who had used bupropion previously (15%) or NRT (25%) were significantly more likely to perceive these methods as effective ($P = 0.03$ and $P = 0.05$, respectively). Prior use and perceived effectiveness of both brief counselling/advice from a health professional and group counselling/quit programmes were not significantly related ($P = 0.14$ and $P = 0.10$, respectively).

Intentions to quit at baseline

Overall, 41% ($n = 254$) of smokers intended to quit within the next year. Logistic regression was used to examine whether awareness, general effectiveness, and the specific effectiveness of cessation methods were associated with intentions to quit at baseline. As Table 1 indicates, each of the three measures was positively associated with intentions to quit, adjusting for demographic variables and smoking-related measures.

Quit attempts at follow-up

A total of 23% ($n = 100$) participants made an attempt to quit smoking during the 3-month follow-up period. Of these, 40 (11% of the total sample) had achieved at least 7 days of continuous abstinence, with an average length of 5 weeks continuous abstinence at follow-up.

Table 1 Logistic regression analyses predicting cessation-related outcomes.

Variable	β	Adjusted OR*	95% CI [†]	P
1. Intentions to quit at baseline ($n = 616$) (0 = No intention to quit within 6 months, 1 = intention)				
Number of methods recalled	0.10	1.21	1.06–1.38	0.004
General effectiveness	0.59	1.80	1.12–2.90	0.015
Specific effectiveness	0.13	1.14	1.06–1.23	0.001
2. Quit-attempts at 3-month follow-up ($n = 432$) (0 = No quit attempts, 1 = at least one attempt)				
Number of methods recalled	0.01	1.01	0.86–1.19	NS
General effectiveness	0.59	1.80	1.03–3.16	0.04
Specific effectiveness	0.07	1.08	0.99–1.17	0.08
3. Adoption of cessation assistance at 3-month follow-up ($n = 100$) (0 = attempted to quit without any assistance, 1 = attempted to quit with assistance) [‡]				
Number of methods recalled	0.03	0.97	0.70–1.34	NS
General effectiveness	1.29	3.62	1.04–12.58	0.04
Specific effectiveness	0.28	1.33	1.06–1.66	0.01

*Odds ratios are adjusted for age, gender, education, cigarettes/day, years smoking and previous quit attempts. Note that odd ratios for models 2 and 3 are also adjusted for intentions to quit at baseline. [†]Confidence interval. [‡]Cessation assistance included pharmacotherapy, self-help materials, counselling from health professional, or other counselling/quit programme.

Logistic regression was used to determine whether awareness, general effectiveness and the specific effectiveness of cessation methods at baseline could predict quit attempts at follow-up. Table 1 indicates that participants who perceived cessation methods in general to be effective at baseline were 1.80 (1.03–3.16) times more likely to make a quit attempt at follow-up, compared to those who perceived no benefit. Awareness of cessation methods was unassociated with quit attempts, while the perceived effectiveness of specific cessation methods was not significantly associated with attempts to quit ($P = 0.08$).

Adoption of cessation assistance at follow-up

Of the participants who attempted to quit, 30% ($n = 30$) adopted at least one of the following forms of cessation assistance: NRT ($n = 23$), bupropion ($n = 9$) and self-help materials ($n = 1$). No participants who attempted to quit reported receiving counselling from a health professional or participating in any sort of quit programme or service. Table 1 indicates that participants who, at baseline, perceived cessation methods to be beneficial were 3.62 (1.04–12.58) times more likely to adopt cessation assistance in the next 3 months, while smokers who perceived specific methods to be more effective were 1.33 (1.06–1.66) times more likely to adopt assistance. There was a strong association between daily cigarette consumption and the adoption of assistance ($r = 0.22$, $P = 0.03$), and the adoption of NRT ($r = 0.81$, $P < 0.001$) and Zyban in particular ($r = 0.42$, $P < 0.001$). Of those who made an attempt to quit there was a strong, although non-significant, positive trend between adopting cessation assistance and abstinence at follow-up were (OR = 3.06, $P = 0.08$).

DISCUSSION

These results suggest that many smokers are unaware of the available range of cessation alternatives. It is not surprising that participants were more aware of pharmaceutical aids than behavioural treatments, given that products such as the nicotine patch and gum are promoted through mass media and health professionals, while behavioural interventions rely typically on more local, limited promotional efforts. More surprising, given the heavy marketing, is that one-third of smokers could not recall NRT products and less than half recalled bupropion. Although recall of stop-smoking medications was lower than expected, these findings nevertheless suggest an increase in recent years [14]. It is also noteworthy that approximately one-quarter of participants in the current study recalled at least one cessation method with no

evidence of effectiveness; most notably, hypnosis and acupuncture [4].

Many smokers also underestimated the effectiveness of cessation methods. More than one-third did not believe pharmaceutical aids would help them to quit. The perceived ineffectiveness of behavioural interventions is also disturbing, given that they are both effective in their own right and capable of enhancing the success of pharmacological interventions [4].

The findings on perceived effectiveness yield what appear to be an interesting contradiction: virtually all smokers who reported that they were as likely to quit on their own as they were with help, if they really wanted to quit smoking, also reported that at least one specific method of assistance would increase their odds of quitting. This apparent inconsistency might be explained by the perceived importance of willpower to quitting, expressed in the phrase 'if you really wanted to quit smoking'. Anecdotal evidence suggests a widespread belief among smokers that those who are highly motivated to quit do not need, or will not benefit from help. Although psychosocial factors such as self-efficacy are important predictors of cessation [21], this is an erroneous belief: randomized trials demonstrate that behavioural and pharmacotherapeutic interventions increase long-term cessation above and beyond motivation to quit and other psychosocial variables. The current findings suggest a need to examine how willpower and motivation shape decisions around treatment adoption more closely.

The findings also indicate that smokers who perceived cessation assistance to be more effective were more likely to adopt assistance when attempting to quit at follow-up. As expected, heavier smokers were much more likely to adopt assistance while quitting and to adopt pharmacotherapy, in particular. Greater cessation knowledge would meet the obvious, but practical, need for concrete information on how to access cessation resources. Some smokers may be reluctant to use OTC NRT, for example, without a better understanding of the product and its proper use. Although the rate of adoption of cessation methods in the current sample (30%) suggests an increase over the past decade in the use of cessation assistance among Canadian smokers, this rate remains unacceptably low.

Participants who rated cessation methods as effective were also more likely to intend to quit and were nearly twice as likely to make a quit attempt at follow-up. This suggests that perceived effectiveness may influence not only *how*, but *when* smokers attempt to quit. To this end, increases in the awareness of cessation assistance and its effectiveness may provide smokers with greater outcome expectancy and self-efficacy to quit smoking. This may be particularly important for the majority of smokers who have made previous unsuccessful attempts to quit

smoking. Alternatively, smokers who are not intending to quit may simply be reluctant to acknowledge the benefit of cessation methods as a means to justify their inaction and continued smoking.

When interpreting smokers' perceptions of effectiveness it should be noted that smokers may have good reason, either through past experience or strong personal preference, to believe that a particular method would not help them to quit smoking. As a result, non-adoption of certain cessation methods may represent an informed self-selection decision. However, the current results suggest that perceived effectiveness of cessation methods is not simply a function of past experience or personal preference, but is also a product of ignorance or misunderstanding. Indeed, previous use was associated positively with perceived effectiveness. This is consistent with the finding that a substantial proportion of NRT users are 'repeat customers' [22].

Finally, virtually all smokers reported a desire for additional cessation information. This is consistent with previous findings that the majority of smokers are interested in concrete information on different ways to quit in general, as well as how to obtain and use specific methods such as different types of NRT [23]. Smokers who perceived cessation methods to be ineffective were significantly more likely to want additional information on how to quit and where to get help.

There are several limitations to the study. Although 'cessation method' was defined as broadly as possible, there may have been differences between smokers as to what is considered a cessation method. For example, none of the participants who made a quit attempt at follow-up reported receiving counselling from a health professional, yet 9% had used prescription pharmacotherapy. It is unclear whether none of these participants received any counselling or whether participants simply did not consider counselling from a health professional as a cessation aid or form of assistance. Perhaps most importantly, this study did not have sufficient power or length of follow-up to determine the impact of cessation knowledge on long-term abstinence. However, in addition to demonstrating a strong association between measures of cessation knowledge and a key psychosocial indicator of quitting (intentions to quit), this study also found that that cessation knowledge could predict quit attempts and the adoption of cessation assistance. Finally, this study only assessed awareness and perceptions of cessation methods that were readily available in South-Western Ontario at the time of the study. As a result, other forms of cessation assistance, such as telephone information lines and newer types of NRT, were not addressed by the current study.

As efforts to communicate the risks of smoking increase in scope and intensity via graphic cigarette

warnings and media campaigns, the tobacco control community must also extend help to current smokers who wish to quit. Indeed, the literature on health communication and persuasive messages suggests that efforts to increase perceptions of risk will be more effective in encouraging smokers to quit if they are accompanied by strong efficacy messages [24]. To this end, the current findings indicate a need to balance health risk information with initiatives that increase awareness of cessation methods and their effectiveness: in addition to yelling 'fire!' the tobacco control community must do a better job of leading smokers to the exit. Cessation information needs to be communicated directly to smokers by health professionals through greater adherence to clinical practice guidelines, but also by population-based means such as the mass media. These findings also suggest the need for additional research into the psychological barriers to adopting cessation assistance. As an increasing proportion of smokers try pharmaceutical aids such as NRT, future work might also consider the influence of past experience on perceptions and future use more closely.

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