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Nicotine replacement therapy 'gift cards' for hospital inpatients who smoke: a prospective before-and-after controlled pilot evaluation

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ABSTRACT

Introduction A common barrier identified by individuals trying to quit smoking is the cost of cessation pharmacotherapies. The purpose of this evaluation was to: (1) Assess the feasibility of offering nicotine replacement therapy (NRT) 'gift cards' to hospitalised smokers for use posthospitalisation; and, (2) Estimate the effect of providing NRT gift cards on 6-month smoking abstinence.

Methods A prospective, quasi-experimental, before-and-after controlled cohort design with random sampling was used to compare patients who had received the Ottawa Model for Smoking Cessation (OMSC) intervention ('control') with patients who received the OMSC plus a \$C300 Quit Card ('QCI'), which they could use to purchase any brand or form of NRT from any Canadian pharmacy.

Results 750 Quit Cards were distributed to the three participating hospitals of which 707 (94.3%) were distributed to patients. Of the cards received by patients, 532 (75.2%) were used to purchase NRT. A total of 272 participants completed evaluation surveys (148 control; 124 QCI).

Point prevalence abstinence rates adjusted for misreporting among survey responders were 15.3% higher in the QCI group, compared with controls (44.4% vs 29.1%; OR 1.95, 1.18–3.21; $p=0.009$). Satisfaction was high among participants in both groups, and among staff delivering the QCI. QCI participants rated the intervention as high in terms of motivation, ease of use and helpfulness.

Conclusions The NRT gift card appears to be a feasible and effective smoking cessation tool that removes a primary barrier to the use of evidence-based smoking cessation pharmacotherapies, while motivating both patients and health providers.

INTRODUCTION

Tobacco smoking causes multiple preventable chronic conditions, including cardiovascular and respiratory diseases and cancer^{1,2} and is a leading avoidable cause of death in Canada.³ Direct annual costs to the Canadian healthcare system due to smoking are estimated at \$C6.5 billion, and smoking-attributable healthcare use will cost approximately \$C80 billion over the next 20 years.⁴ Quitting smoking before the age of 40 years eliminates 90% of an individual's risk of smoking-associated premature morbidity and mortality.⁵

While progress has been made over the past four decades in reducing current smoking prevalence

in Canada to under 15%, recent evidence suggests that the steady decline may be reversing for the first time.⁶ Increased cessation efforts will be necessary if we are to reach Canada's goal of 5% prevalence by 2035.⁷ Smoking rates have been found to be between 5% and 8% higher among patients admitted to hospitals, compared with the general population.^{8,9} In Canada, individuals who smoke are hospitalised, on average, 12 years earlier than non-smokers.⁸ Delivery of cessation interventions to patients in hospital settings can lead to significant improvements in long-term smoking abstinence, mortality and hospitalisations.⁸ There is a need and opportunity to enhance the implementation of proactive smoking cessation interventions in all clinical settings.

The use of nicotine replacement therapy (NRT) during a smoking cessation attempt increases the odds of quitting by >50%.¹⁰ NRT helps reduce nicotine withdrawal symptoms (eg, urges to smoke, irritability, feelings of anxiety), easing the transition from cigarette smoking to sustained smoking abstinence.¹¹ A common barrier identified by individuals trying to quit smoking is the cost of cessation pharmacotherapies. A growing body of evidence demonstrates the effectiveness of financial incentives for increasing quit attempts and smoking cessation in non-clinical populations.^{12,13}

The purpose of this evaluation was to: (1) Assess the feasibility of offering NRT 'gift cards' to hospitalised smokers for use posthospitalisation; and, (2) Estimate the effect of providing NRT gift cards on 6-month smoking abstinence.

METHODS

Design and settings

A prospective, quasi-experimental, controlled cohort design with random sampling was used to compare patients who had received the Ottawa Model for Smoking Cessation (OMSC) intervention ('control') with patients who received the OMSC plus a \$C300 NRT gift card ('Quit Card'), which they could use to purchase any brand or form of NRT from any Canadian pharmacy. This amount (\$C300) was chosen based on budget, target number of patients and the desire to cover at least 1 month's worth of daily combination NRT (one patch plus one form of short-acting NRT per day) during the study period. Participants were recruited from three hospitals in Ontario, Canada: the University of Ottawa Heart Institute, a tertiary care cardiac hospital; the Ottawa Hospital Civic Site, an urban



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general hospital; and, Cornwall Community Hospital, a small-town general hospital.

Participants

Control

The control group consisted of a random sample of participants who had received the standard OMSC in-hospital intervention¹⁴ between November 2017 and April 2018, the 5-month period immediately following the Quit Card pilot. Using standardised consultation and order forms, the control group was offered brief bedside advice regarding quitting smoking, NRT while in hospital to help manage nicotine withdrawal symptoms and enrolment in posthospitalisation automated telephone follow-up support (TelASK Technologies) monitored by smoking cessation nurse specialists for up to 6 months.¹⁵ No free medication or Quit Card was provided to control participants on hospital discharge.

Quit Card intervention

The Quit Card intervention (QCI) group received the same standard OMSC in-hospital intervention as did the control group between July 2017 and October 2017; in addition they received a Quit Card (STI Technologies Inc., Halifax, NS, Canada) worth \$C300 valid only for the purchase of NRT. Participants could take the Quit Card to any pharmacy and use it to purchase any form or brand of NRT (Natural Product Number was specified and programmed on the card). The card included instructions for pharmacists to process the card in the same manner they do other medication-insurance cards. STI Technologies reimbursed the pharmacy and provided tracking of individual card use, including date, location, NRT type, dose and cost. Three batches of Quit Cards were distributed, each batch with a 2-month expiration date to encourage participants to redeem the card within that period. As a result, some patients had up to 2 months to redeem their cards, whereas others had only a few days.

Randomisation and recruitment

Patients were eligible to be contacted for this evaluation if they had received an OMSC intervention while in hospital during either the control or QCI time periods. Random subsamples of eligible control and QCI participants were selected to be contacted 6 months following their hospitalisation. Randomisation was stratified by site to account for differences in size and population. Block randomisation was used for the two larger hospitals; participants were sorted into 2-week blocks based on their hospital discharge date. Using an online random number generator, half of the participants in each block were selected to be contacted. For the smaller hospital, the participants were sorted by discharge date, and sequentially assigned to group A or B. Using a coin toss, the participants assigned to group B were selected to be contacted. Those selected to be contacted were called no more than five times, leaving up to three voicemails. A total of 548 participants were randomly selected; 274 from each group.

Variables, outcomes and data sources

Participants were contacted by telephone to complete a survey that collected sociodemographic (age, sex, education, income), smoking-related (cigarettes smoked per day, other smokers in the home) and health-related (history of depression and/or anxiety, alcohol use, cannabis use) variables.

Feasibility outcomes included: number of Quit Cards distributed to participating hospitals; number of Quit Cards distributed

to patients (calculated as number of cards sent to participating hospital minus the number of unused cards returned at the end of the programme); number of Quit Cards redeemed by patients (reported on the STI Technologies platform); dollar amount used to purchase NRT (reported on the STI Technologies platform); type of NRT purchased (brand, type and amount reported on the STI Technologies platform); and, type and amount of NRT used (participant self-report). Using Likert Scales of 1 (not very) to 5 (extremely), all participants were asked to rate their satisfaction with the support they received, and QCI participants were asked to rate the extent to which they found the Quit Cards to be motivating, easy to use and helpful. Given QCI participants had different amounts of time to redeem their Quit Cards depending on when they received the card and the expiration date, we tracked the median number and range of days participants had to redeem their Quit Cards and assessed whether redemption rates, amount of NRT purchased and quit rates differed depending on how much time they had to use their card.

To estimate the effect of QCI on quitting, self-reported 7-day point prevalence smoking abstinence ('Have you smoked any form of tobacco in the past 7 days?') was gathered at 6 months. A random subsample of participants (representing approximately 10% of participants from each group) was asked to complete an expired carbon monoxide (CO) test. A CO reading of ≤ 4 ppm was considered confirmation of smoking abstinence. Abstinence rates were adjusted based on the observed misreporting rates.

To determine the perceived benefits and challenges of the intervention from hospital staff, a postprogramme survey (Appendix A: online supplemental material 1; pp. 2–13 (figures B–F, tables A,B)) was sent to staff involved in coordinating and/or delivering the QCI at their site. Each staff member surveyed had experienced offering the OMSC intervention to patients with and without Quit Cards.

Statistical methods

Feasibility outcomes and staff survey data were summarised using descriptive statistics. Binary logistic regression was used to assess smoking abstinence by group (control vs QCI) and in subgroup analyses. Our primary analysis of cessation compared the outcomes of survey responders only. A sensitivity analysis of cessation outcomes using intention-to-treat principles (the Russell standard)¹⁶ was also completed, whereby patients who had died, had a wrong number, had a language barrier, did not smoke cigarettes, had moved to long-term care or hospice, or for other reasons were deemed ineligible (eg, denied receiving the intervention) were removed from the analysis, and patients who did not answer or refused to complete the survey were assumed to be smoking. Several subgroups were identified by the evaluation team a priori to determine which variables would be important to consider in future trials. These included: sex, education, income, community size, cigarettes per day, living with other smokers, history of depression, history of anxiety, alcohol-use and cannabis-use. Little's missing completely at random (MCAR) test was used. If data were found to be missing at random, multiple imputation would have been completed using the regression method. If missing data were found to be MCAR or missing not at random, only observed data would have been used.¹⁷ All assumptions of binary logistic regression were confirmed (linear relationship between the logit of the outcome variable and each selected predictor variable; no extreme values or outliers in continuous predictor variables; no high intercorrelations among the predictors). Analyses were carried out using IBM SPSS Statistics V.26.

Bias

While this evaluation involved a real-world quality-improvement pilot programme using a before and after cohort design, efforts were made to reduce potential biases. To limit selection bias, random subsamples of control and QCI participants were selected to be contacted for this evaluation. To increase generalisability of the results, the evaluation took place at three locations—two major urban institutions and one small town hospital. To limit observer bias, outcome assessors were at arm's length to the OMSC programme and were not informed of the evaluation's objectives and hypotheses. To limit history bias and to avoid potential contamination/cross-over, the two cohorts were selected within a few months of each other and with the controls being recruited after expiration of the Quit Card programme. To limit response bias, smoking abstinence outcomes were adjusted using the CO test results.

Power

Power was calculated a priori to determine the number of participants to randomly select. We randomly selected 548 participants (274 control, 274 QCI), assuming a response rate of 68% (372 completed surveys) would be achieved, based on the 6-month response rate observed in a previous programme study.¹⁵ Using logistic regression, with 186 in each group, we would have 80% power (two-sided test; $\alpha=0.05$) to detect an OR of 1.84 for QCI versus control, assuming the QCI odds were similar to studies of NRT versus control.¹⁸

RESULTS

Participants

We reached 73.1% of our 372 target, with 272 completed surveys (148 control; 124 QCI). Figure 1 displays the participant flow and reasons for exclusion. Results of Little's MCAR test identified that missing data were MCAR ($\chi^2=1.236$, $p=0.266$), therefore, only observed data were used. Groups were similar in terms of baseline characteristics (table 1).

Feasibility

The feasibility outcomes are summarised by hospital in table 2. A total of 750 Quit Cards were distributed to the three participating hospitals of which 707 (94.3%) were distributed to patients. Of the cards received by patients, 532 (75.2%) were used to purchase NRT. The average amount redeemed per card was \$C246 (\pm \$C74.1, 82%) of a possible \$C300. QCI participants had a median of 29 days (range: 2–60 days) to redeem their Quit Card. Redemption rates were similar between those who had <1 month ($n=60$) and those who had >1 month ($n=59$) to redeem their card (73.3% vs 76.3%, respectively). There was no significant difference in the mean dollar amount spent on NRT per card for those who had <1 month and those who had >1 month to redeem their card ($\$C252\pm$ \$C67.9 vs $\$C241\pm$ \$C79.6, respectively; $p=0.483$). Despite the short amount of time, 100% of participants who had <1 week to redeem their quit card ($n=16$) did so, and they purchased an average of \$C234 (\pm \$C78.6, 78%) worth of NRT.

Online supplemental appendix A, figure A (pg.1) summarises self-reported smoking cessation pharmacotherapy use in the 6 months following hospitalisation by group and demonstrates a doubling or tripling of NRT product use among QCI participants. Patient satisfaction and motivation results are summarised in figure 2. Among QCI participants, 62.8% reported the Quit Card being the main reason they attempted to quit, and that they may not have otherwise attempted.

Smoking abstinence

The self-reported, unadjusted, 7-day point prevalence abstinence rate among survey responders gathered at 6 months was an absolute 12.0% higher in the QCI group, compared with the control group (53.2% vs 41.2%; OR 1.62, 1.00–2.63; $p=0.048$). A total of 12 participants from each group (24 total) were randomly selected to complete a CO test, of whom 11 completed from the QCI group, and 9 from the control group. Misreporting (ie, CO value >4 ppm) was observed in 9.1% of the QCI participants and

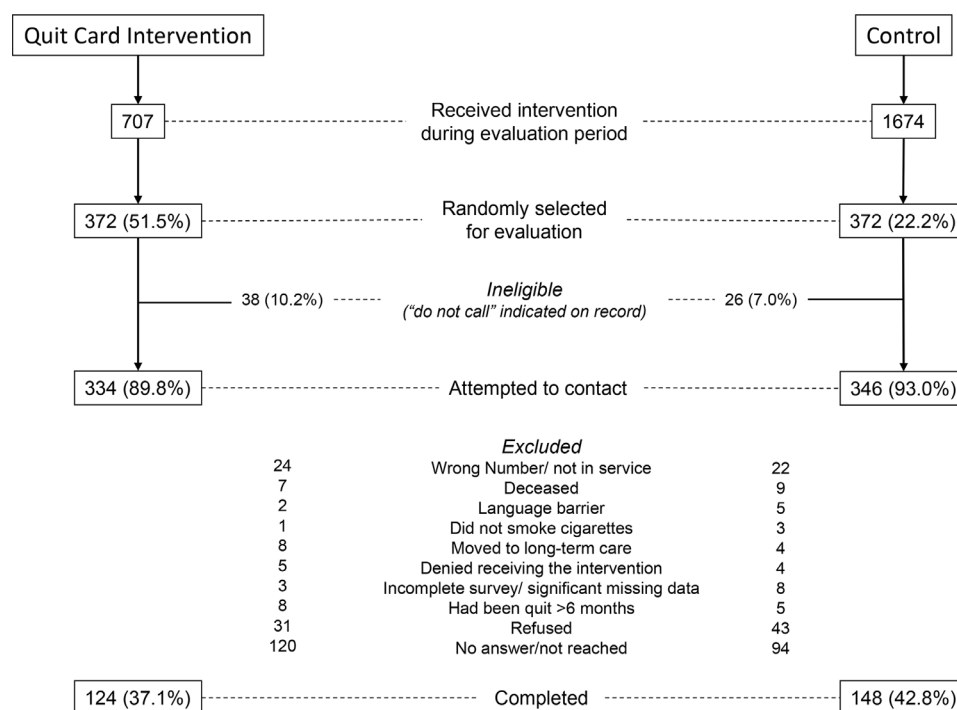


Figure 1 Participant flow.

Table 1 Participant characteristics

	QCI (n=124)	Control (n=148)	Overall (n=272)	P value
Age, mean (SD)	60.1 (10.4)	59.4 (13.6)	59.7 (12.2)	0.652*
Sex, n (%)				0.901†
Male	76 (61.3)	89 (60.1)	165 (60.7)	
Female	48 (38.7)	59 (39.9)	107 (39.3)	
Community population size, n (%)				0.716†
Large (>100 000)	65 (52.4)	81 (54.7)	146 (53.7)	
Medium (30 000–99 000)	55 (44.4)	64 (43.2)	119 (43.8)	
Small (<30 000)	4 (3.2)	3 (2.0)	7 (2.6)	
Cigarettes smoked per day at baseline, mean (SD)	20.7 (11.5)	18.5 (9.8)	19.5 (10.7)	0.100*
Missing, n (%)	2 (1.6)	10 (6.7)	12 (4.6)	
Lives with other smokers, n (%)				0.235†
Yes	40 (34.2)	54 (41.5)	94 (38.1)	
No	77 (65.8)	76 (58.5)	153 (61.9)	
Missing	7 (5.6)	18 (12.2)	25 (10.1)	
History of mood disorder, n (%)				0.240†
Yes	29 (23.8)	28 (18.9)	57 (21.2)	
No	93 (75.0)	119 (80.9)	212 (78.8)	
Missing	2 (1.6)	1 (0.7)	3 (1.1)	
History of anxiety disorder, n (%)				0.101†
Yes	21 (17.2)	17 (11.5)	38 (14.1)	
No	101 (82.7)	130 (88.4)	231 (85.9)	
Missing	2 (1.6)	1 (0.7)	3 (1.1)	
Education, n (%)				0.180†
Elementary school or less	8 (6.5)	10 (6.8)	18 (6.6)	
Some high school	30 (24.2)	32 (21.6)	62 (22.8)	
High school diploma	36 (29.0)	34 (23.0)	70 (25.7)	
Some postsecondary	9 (7.3)	21 (14.2)	30 (11.0)	
College or trade certificate	26 (21.0)	34 (23.0)	60 (22.1)	
University degree	15 (12.1)	17 (11.5)	32 (11.8)	
Income‡, n (%) <\$C25 000	28 (22.6)	21 (14.2)	49 (18.0)	0.496†
\$C25 000–\$C50 000	43 (34.7)	59 (39.9)	102 (37.5)	
\$C50 000–\$C75 000	15 (12.1)	20 (13.5)	35 (12.9)	
>\$C75 000	21 (16.9)	25 (16.9)	46 (16.9)	
Prefer not to answer	17 (13.7)	23 (15.5)	40 (14.7)	
Cannabis use in past 6 months, n (%)				0.948†
Yes	23 (18.5)	26 (18.1)	49 (18.3)	
No	101 (81.5)	118 (81.9)	219 (81.7)	
Missing		4 (2.8)	4 (1.5)	
Alcohol drinks per week, n (%)				0.952†
Does not drink alcohol	58 (47.9)	71 (48.6)	129 (48.3)	
< 1	14 (11.6)	14 (9.6)	28 (10.5)	
1–5 (female); 1–8 (male)	26 (21.5)	35 (24.0)	61 (22.8)	
6–10 (female); 9–15 (male)	13 (10.7)	13 (8.9)	26 (9.7)	
≥11 (female); ≥16 (male)	10 (8.3)	13 (8.9)	23 (8.6)	
Missing	3 (2.4)	2 (1.4)	5 (1.9)	

*Independent samples t-test

†Pearson χ^2 test

‡\$C, 2017–1

QCI, Quit Card Intervention.

12.5% of the control participants. The difference in misreporting between groups was not statistically significant ($\chi^2=0.057$; $p=0.811$). Point prevalence abstinence rates adjusted for misreporting were 15.3% higher in the QCI group, compared with controls (OR 1.95, 1.18–3.21; $p=0.009$) (figure 3). Results of the intention-to-treat analysis (assuming non-responders were smoking) found point prevalence abstinence to be 3.0% higher in the QCI group, compared with the control group (23.8% vs 20.8%; OR 1.53, 1.03–2.28; $p=0.038$).

Table 2 Feasibility outcomes of programme distribution and redemption, by site

	Quit Cards distributed to hospital, n	Quit Cards distributed to patients by hospital staff, n (%)	Quit Cards redeemed by patients, n (%)
Hospital A	350	333 (95.1)	236 (70.9)
Hospital B	275	255 (92.7)	201 (78.8)
Hospital C	125	119 (95.2)	95 (79.8)
Total	750	707 (94.3)	532 (75.2)

In looking at QCI participants only, those who had <1 month to redeem their Quit Card had a higher abstinence rate than those who had >1 month to redeem, although this was not statistically significant (56.3% vs 47.5%, respectively; $\chi^2=1.88$, $p=0.170$).

Among those who had not quit, 75.8% (50/66) of QCI participants and 63.2% (55/87) of control participants reported having made at least one quit attempt during the evaluation period.

Subgroup analyses

Not having used cannabis in the past 6 months, having an annual income of \geq \$C75 000, and not living with other smokers were positively associated with smoking abstinence. Non-cannabis users had nearly a 28% higher cessation rate, compared with co-users (51.8% vs 24.0%; OR 3.40, 95% CI 1.69 to 6.86). Those with an annual income of over \$C75 000 had a 30.7% higher cessation rate, compared with those with an income of <\$C25 000 (67.4% vs 36.7%; OR 3.56, 95% CI 1.53 to 8.30). Participants who did not live with other smokers had a 12.5% higher cessation rate than those who did live with other smokers (51.5% vs 39.0%; OR 1.73, 95% CI 1.03 to 2.89). Quit Card remained a statistically significant predictor of quitting after adjusting for cannabis use, income and living with other smokers (OR, 1.75, 1.05–2.93; $p=0.03$). Participants who did not have a history of anxiety or depression had quit rates \geq 8% higher than their counterparts; these differences were not statistically significant.

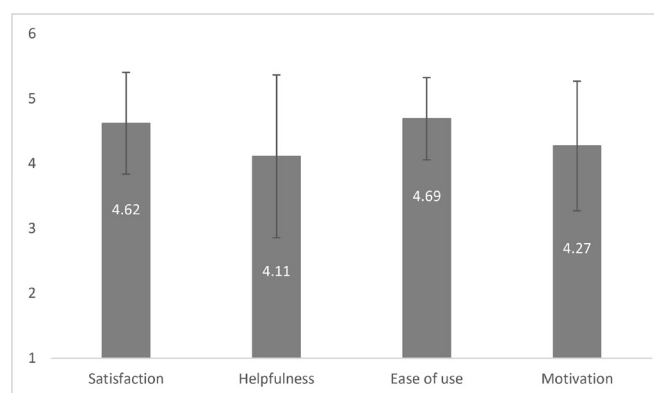


Figure 2 Programme satisfaction ratings for the Quit card intervention (QCI) group; mean scores out of 5. SD shown as error bars. Satisfaction: 'How satisfied are you with the support you've received from the programme?' Helpfulness: 'How helpful was the Quit Card in helping you quit or reduce smoking?' Ease of use: 'How easy was it to use the Quit Card to purchase your nicotine replacement therapy?' Motivation: 'How much did the Quit Card motivate you to attempt to quit smoking?'

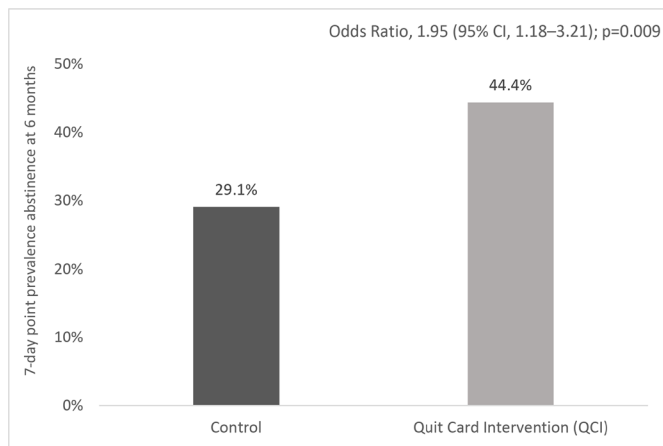


Figure 3 Seven-day point prevalence abstinence rates among survey responders, gathered at 6 months and adjusted for misreporting.

Staff surveys

A total of 19 staff members involved in coordinating or delivering the smoking cessation interventions at their site completed the postprogramme staff survey. A full summary of the results can be found in online supplemental appendix A (pp. 2–13). The majority (58%) ranked their satisfaction with the programme as 10/10, with 84% ranking their satisfaction between 8 and 10. The majority (94%) felt that having Quit Cards to offer made it easier to intervene with patients who smoke. Seventy-eight per cent felt the Quit Card increased the motivation of staff to intervene with patients who smoke, and 100% felt that Quit Cards increased the motivation of patients to quit smoking. Nearly 80% (15/19) of those surveyed responded to the open-text question regarding the benefits of the programme. The most common themes surrounding the benefits of the Quit Card programme were: (1) Removing the barrier of cost of cessation pharmacotherapy for patients, particularly for lower income patients; (2) The card as an effective cessation tool for staff that facilitated their smoking cessation conversation with patients, (3) The card increasing motivation of patients to quit, (4) The card being convenient, flexible and providing continuity of care, and (5) Feelings of gratitude from patients towards staff. All staff surveyed responded to the open-text question regarding the challenges of the programme. Six (31.6%) responded that there were no challenges. The most common themes surrounding challenges were: (1) Pharmacies not initially knowing how to process the cards, charging dispensing fees and not always having enough NRT stock; and, (2) Expiry dates presenting a challenge and pressure for patients to redeem their cards quickly.

DISCUSSION

Our pilot evaluation found NRT gift cards ('Quit Cards') to be a feasible, simple to deliver and promising intervention for hospitalised patients who smoke. Uptake, delivery and satisfaction of the QCI was high among participating hospitals, and redemption and satisfaction rates were high among patients. Point prevalence abstinence at 6-month follow-up was higher for those who received the QCI, compared with controls. Not only was the increase statistically significant, but also higher than the minimal clinically important difference of 5% commonly used in smoking cessation trials. Hospitalisation has been shown to increase one's motivation to quit smoking.¹⁹ All staff surveyed as part of this evaluation perceived that the Quit Card enhanced the motivation of patients to quit smoking.

Not using cannabis was an independent predictor of smoking abstinence in this evaluation. Recreational use of cannabis was legalised in Canada in October 2018. In 2017, prior to legalisation and within the same timeframe of this evaluation, 7.4% of Canadians \geq age 40 years reported cannabis use in the past year.²⁰ This is much lower than the 18.4% prevalence observed among our sample of hospitalised patients who smoke tobacco. Participants who had not used cannabis in the past 6 months had higher odds of quitting smoking. A recent meta-analysis and narrative review of 20 studies (12 randomised controlled trials (RCTs) and 8 uncontrolled trials) found single and multisubstance interventions that addressed tobacco and/or cannabis showed weak evidence for an effect on either tobacco or cannabis cessation among co-users.²¹ Though dual-substance interventions targeting tobacco and cannabis appear to be feasible and acceptable, cannabis use will be an important variable to collect and assess in future tobacco-cessation trials, and more high-quality evidence is needed to determine what interventions may be most effective at helping co-users. Higher income ($>$ \$C75 000 per year) was associated with quitting among participants in both groups, although abstinence rates were an absolute 13.9% higher among lower-income Quit Card participants, compared with lower-income control participants. As this intervention was designed, in part, to remove the barrier of cost of cessation therapies, participant income may be an important consideration in the design of future trials.

Our study adds to the growing evidence base examining the utility of financial incentives for smoking cessation in clinical and non-clinical populations. A systematic review and meta-analysis found that covering the cost of NRT increases the odds of: making a quit attempt (OR 1.11, 95% CI 1.04 to 1.17; four trials); using NRT (OR 1.79, 95% CI 1.54 to 2.09); and smoking abstinence (OR 1.77, 95% CI 1.37 to 2.28; six trials).¹³ Partial coverage also leads to greater quitting, compared with no coverage (OR 1.27, 95% CI 1.02 to 1.59; five trials). A systematic review examining the use of incentives (eg, cash payments, gift cards) aimed at prompting or reinforcing smoking cessation in non-clinical populations found that smokers who received incentives were more likely than controls to be abstinent at \geq 6 months (OR 1.42, 95% CI 1.19 to 1.69; 17 trials).¹² A recent RCT evaluating the effect of paying low-income hospitalised smokers for participating in smoking cessation counselling, using cessation pharmacotherapies, and for being smoke-free found a non-statistically significant, although minimally clinically important, difference of 10.7% in 6-month cessation rates favouring the incentive group, compared with controls (OR 2.56; 95% CI 0.84 to 7.83, $p=0.10$).²² A 2 \times 2 factorial RCT found a 4.5% difference in intention-to-treat smoking abstinence at 6 months among patients discharged from hospital who received NRT patches compared with those who did not receive NRT patches, although the difference was not statistically significant (22.8% vs 18.3%, respectively; $p=0.051$).²³ A three-site RCT found no difference in 6-month biochemically confirmed smoking abstinence between patients who received posthospitalisation automated telephone calls plus a 3-month supply of their cessation medication of choice (single form or combination of nicotine patch, nicotine gum, nicotine lozenge, bupropion or varenicline) and patients who received medication and counselling recommendations only (16.6% vs 15.5%, respectively; RR 1.07 (0.84–1.37)).²⁴

As a patient incentive and promising medication-distribution mechanism, the Quit Card affords numerous advantages: the intervention is easy to deliver and takes minimal time to administer to participants; it requires little storage space; card redemption is tracked in real time, which facilitates distribution and financial management; the programme is only charged for the product purchased, potentially reducing waste and unused or expired product; and, participants

can purchase the product at their own pharmacy, affording another opportunity for intervention with a health provider.

This was a quasi-experimental evaluation of a pilot programme implemented under real-world conditions; however, several efforts were taken to minimise potential biases. An RCT is warranted to study the impact of the QCI using a more rigorous design. While we did randomly select participants from both the control and QCI groups, we did not reach our completed survey target. We estimated that we would reach 68% of participants randomly selected to complete the evaluation; however, this estimate was taken from clinical trial data and did not reflect the response rate observed in this real-world evaluation where patients were not necessarily expecting the call. Nonetheless, we intend to use this randomisation approach in future programme evaluations, where appropriate, and will apply oversampling to increase the likelihood of reaching the recruitment target. While both major urban and small-town hospital sites were used to conduct the evaluation, this multisite evaluation took place in only one region of Ontario, Canada. At the time of the evaluation, the Ontario provincial formulary provided coverage for varenicline and bupropion, but not NRT. This type of incentive programme might yield different results in jurisdictions that have more comprehensive smoking-cessation pharmacotherapy coverage. That said, given the simplicity of Quit Card distribution and management and the potential utility of the card as an incentive or motivational tool, future studies comparing such tools to other medication coverage and distribution mechanisms should be considered. The OMSC programme has previously implemented Quit Card programmes that covered all smoking-cessation pharmacotherapies (ie, NRT, varenicline and bupropion); they may be of further benefit in terms of individualising the intervention for patients. Nearly half of the participants in this evaluation were hospitalised with a cardiac condition. This may have contributed to the relatively high cessation rates observed in both groups. This evaluation only tested results among an inpatient population. The QCI may be useful in other fast-paced, acute care settings given the relative ease with which it can be delivered.

CONCLUSION

The NRT 'gift card' appears to be a feasible and effective smoking cessation tool that removes one of the main barriers to the use of evidence-based smoking-cessation pharmacotherapies, while potentially motivating both patients and health providers. Future studies should consider randomised controlled designs to further evaluate the effect of Quit Cards in a variety of populations and settings.

What this paper adds

- ⇒ The cost of cessation medications is a common barrier identified by individuals wanting to stop smoking. Covering the cost of quit smoking pharmacotherapies, including nicotine replacement therapy (NRT) products, and using incentives to assist people in quitting smoking have been found to increase quit attempts and cessation rates.
- ⇒ The feasibility and effectiveness of distributing gift cards, valid only for the purchase of NRT, have not been evaluated.
- ⇒ This study found that distributing NRT gift cards worth \$C300 to hospitalised patients who smoke was highly feasible and led to increased smoking abstinence at 6 months.
- ⇒ The NRT gift card intervention led to high satisfaction and was perceived to enhance motivation among patients and the hospital staff who were delivering the intervention.

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Competing interests KAM, RDR and ALP are named inventors of the Ottawa Model for Smoking Cessation, a registered trademark and intellectual property of the University of Ottawa Heart Institute. As such, the UOHI and the inventors have potential financial interest should the programme be licensed to a for-profit or private organisation.

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**Nicotine replacement therapy “gift cards” for hospital
inpatients who smoke: a prospective controlled pilot evaluation**

Mullen KA, Walker K, Noble S, Pritchard G, Garg A, Martin N,
Pipe AL, Reid RD

Appendix A: Supplementary Material

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Figure A: Self-reported smoking cessation pharmacotherapy use in the six months following hospitalization, by group 1
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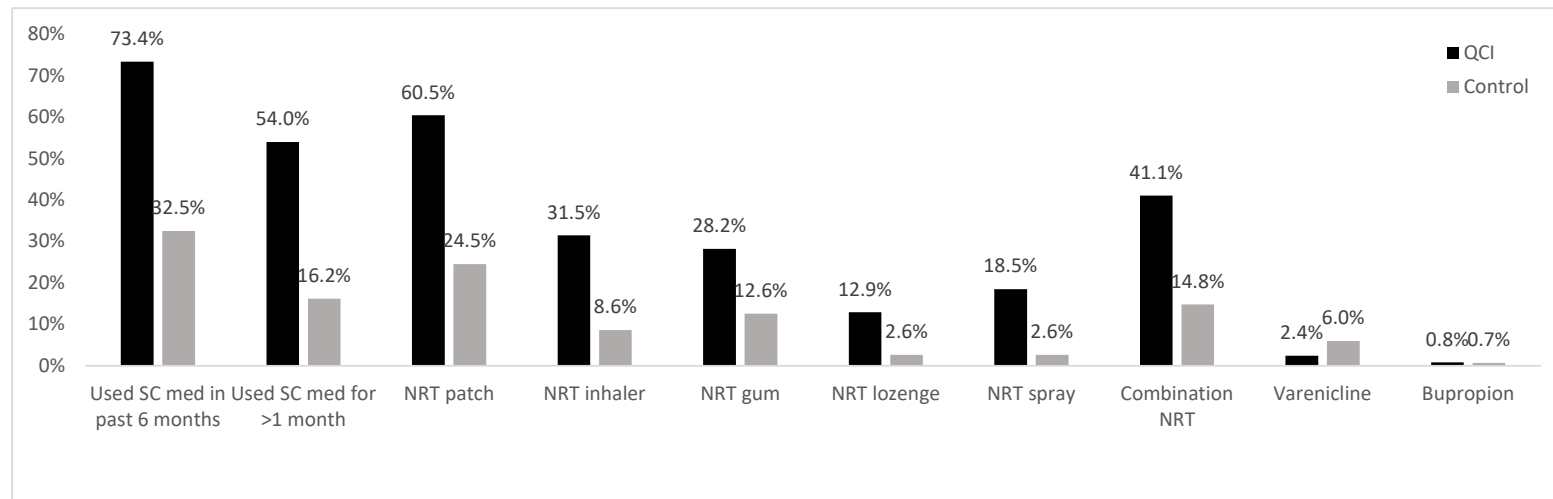


Figure A. Self-reported smoking cessation pharmacotherapy use in the six months following hospitalization, by group

NRT = nicotine replacement therapy; QCI = quit card intervention; SC=smoking cessation

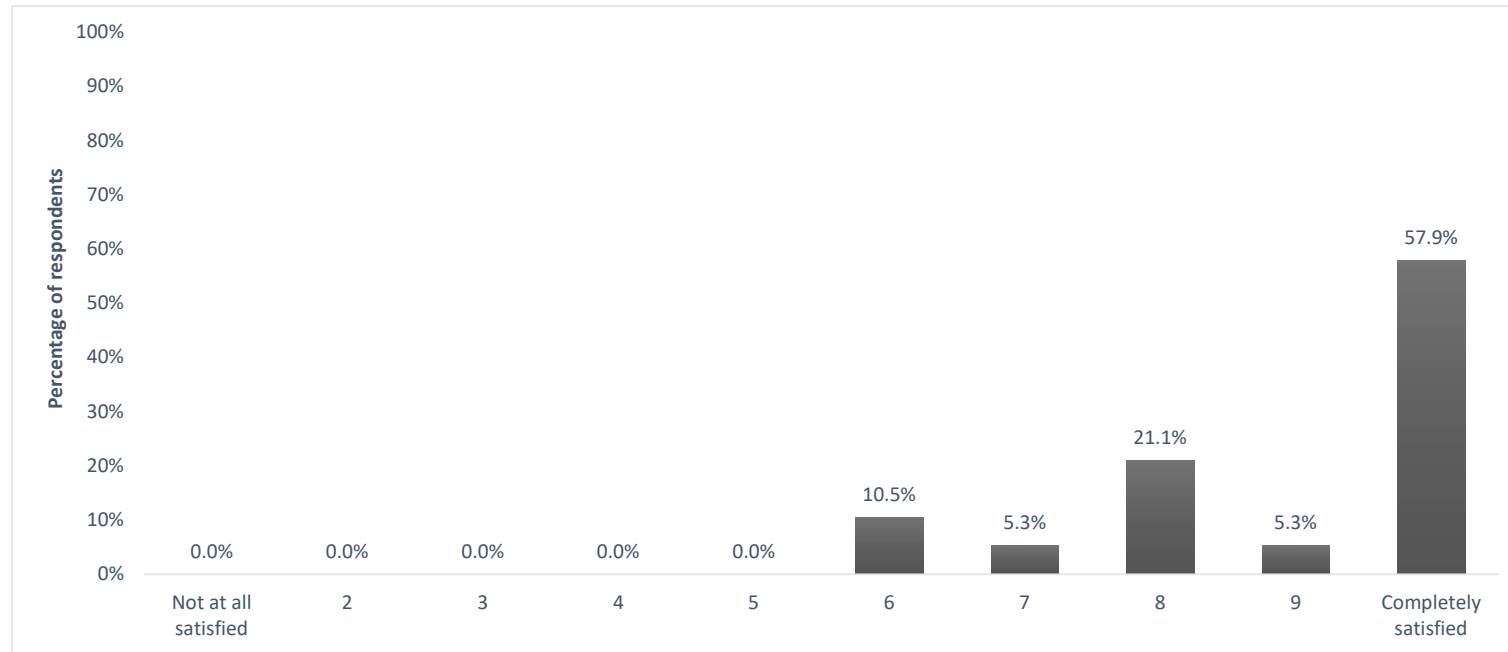


Figure B. How would you rate your overall satisfaction with the Quit Card Program? (n=19)

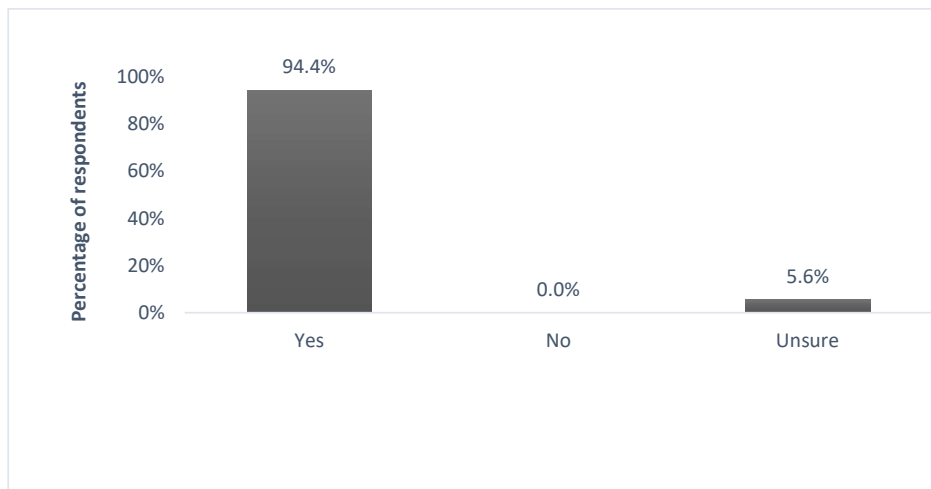


Figure C. Does the Quit Card make it easier to intervene with patients who smoke? (n=18)

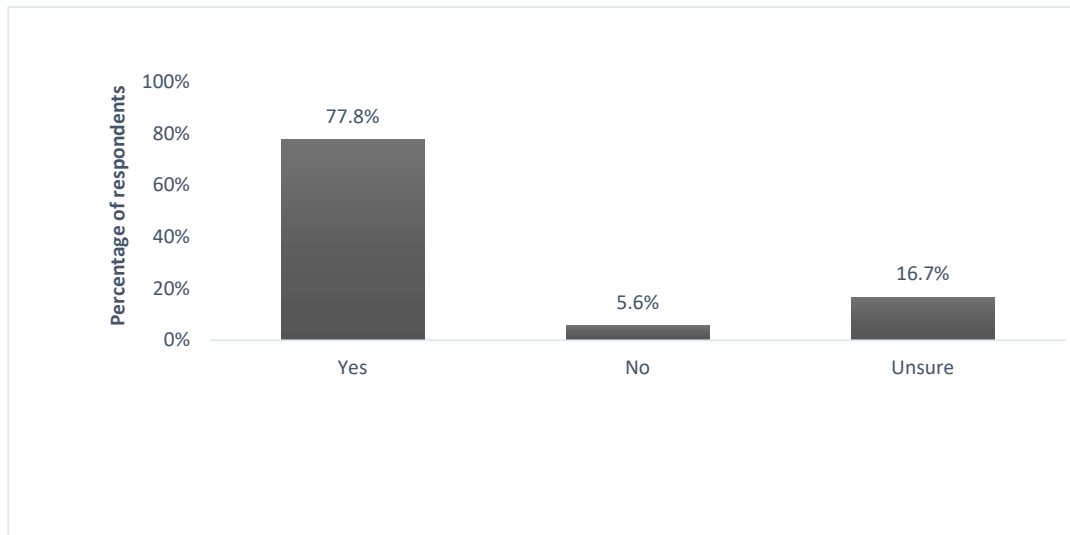


Figure D. Does the Quit Card enhance the motivation of health care providers to intervene with patients who smoke? (n=18)

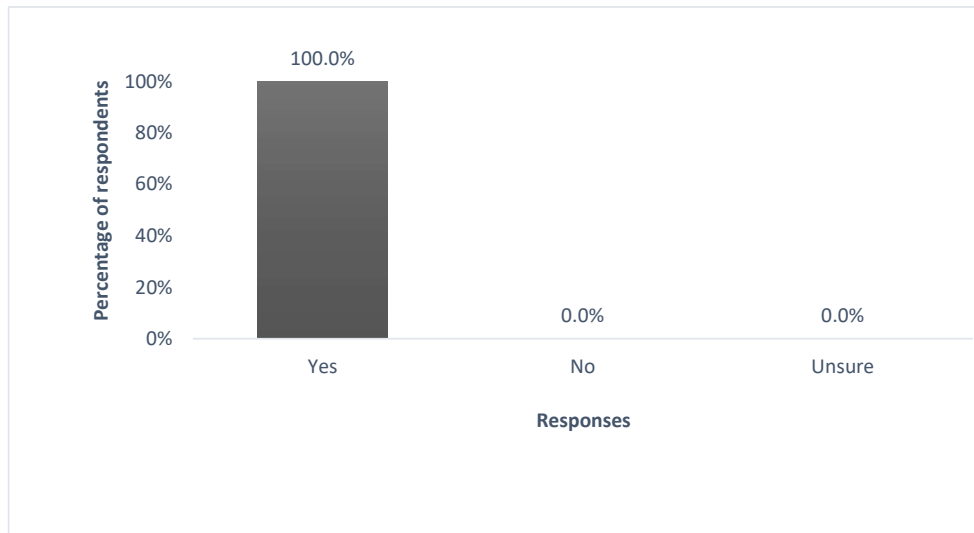


Figure E. Does the Quit Card enhance the motivation of smokers who are considering quitting smoking? (n=19)

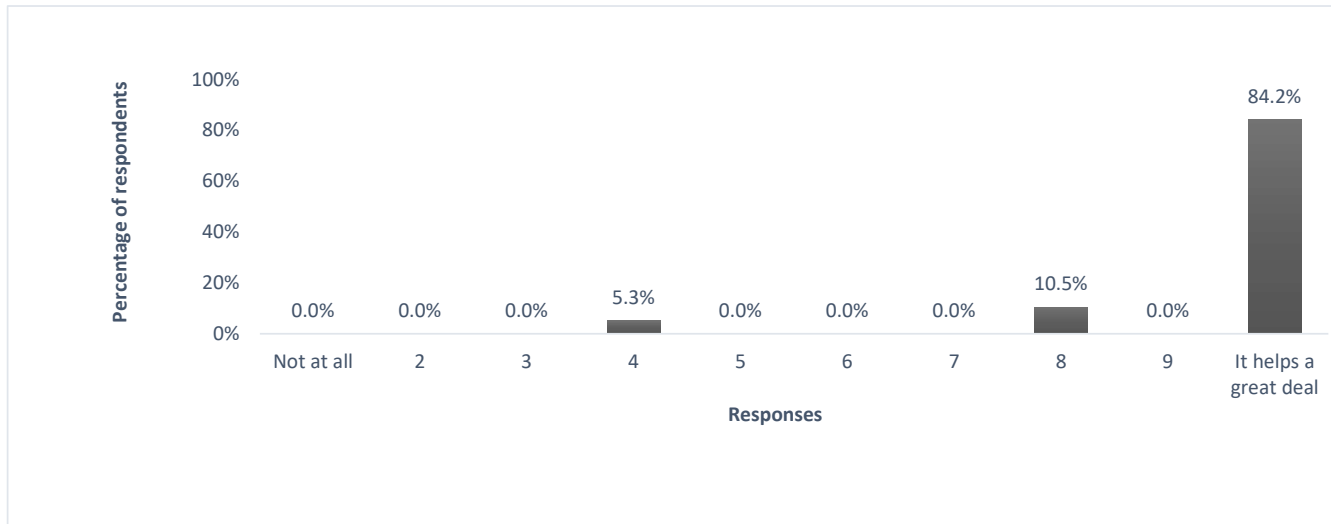


Figure F. How important are Quit Cards in supporting the Smoke-Free Hospital policy? (n=19)

Health Care Professional Survey Responses (open text responses)

Table A: Please describe your thoughts on the benefits of the Quit Card program.

<p>[Respondent 1] <i>The quit cards have been extremely helpful in motivating patients to quit during their stay, and to stay quit. It also helps to enroll patients into the follow up telephone support program as well. Makes patients feel like we really care about their health and the importance of quitting. We've even been able to partner with local pharmacies to have them deliver the products for those patients who don't have access to a vehicle or who are unable to go to pharmacies due to program policies</i></p>
<p>[Respondent 2] <i>Without this program many people may not have the means to continue their quit on discharge from hospital which means higher risk for repeat ED visits and increased risk for 30 day readmission, not to mention the absolute negative direct and indirect health effects for those who use tobacco and are exposed to tobacco. Supporting patients with NRT during admission as well as on discharge to the community with follow up is a requirement. You wouldn't offer someone treatment for other substance disorders then not connect them with resources on discharge...cigarettes/tobacco use is no different...let us not confuse this we have an obligation to treat tobacco use disorder within health care settings and in the community.</i></p>
<p>[Respondent 3] <i>The quit cards were a huge motivator for patients continuing to attempt their quit smoking journey they started with us. Many of our patients are marginalized and have little to no income post hospital stay to fund the products that could help them. Without these cards they will have a much more difficult time being successful.</i></p>
<p>[Respondent 4] <i>A bag of 200 easily obtained/delivered contraband cigarettes = \$20. One box of 7 NRT patches \$35 +. Tobacco users are often challenged financially/socially. Other programs require patients to travel to the health unit/ attend a registration course - some people have significant difficulty doing this (cost/physical limitations). Quit Cards have literally changed lives. (One patient burst into tears when she received the card " you have no idea what this means to me". Another told me she had prayed for an angel to help her quit and that I was her angel).</i></p> <p><i>Many smokers (erroneously) believe the government makes too much money off tobacco taxes to want them to quit - these cards send the message that this is not true.</i></p> <p><i>Staff are MUCH more motivated to encourage quit efforts when they can support it with the actual tools. Patients who receive the card in hospital are also getting the counseling and advise on how to use the NRT (still a lot of misinformation exists on this)</i></p>
<p>[Respondent 5] <i>This was an excellent initiative for Ontarians who use tobacco. My patients were motivated to Quit. My assessment was not just about asking them questions and then not giving them anything, so this was greatly appreciated. As a practitioner, I would like to see more of this program.</i></p>

[Respondent 6] We have been able to provide support to a number of people through use of quit cards. All participants were grateful to this.

[Respondent 7] Patients often use cost as an excuse to prevent them from exploring smoking cessation aids. In the past, explaining the cost of smoking including the cost of cigarettes, medications, time off work due to smoking related illnesses etc. did not convince them to invest in NRT or medications to quit smoking. In this past year, the Quit Card program removed that barrier for me in many situations and patients took up the challenge to quit smoking. Access to free NRT is minimal in our region. Our demographic area has only one FHT, so patient access to OMSC quit programs is not readily available. STOP is available at our CHC, but this past year that program has had its own challenges in being able to support smoking cessation in the community. Our health unit runs 4 STOP sessions throughout the year which is not always timely for our patients that want to quit and only provides 5 weeks of NRT. With easy access to low cost contraband cigarettes and those available on the reservation, convincing people to spend money to quit is a challenge.

[Respondent 8] The other important factor that the Quit Card campaign allowed for, was seamless smoking cessation support from hospital to home. There is unique opportunity to influence the decision to quit while in hospital. Patients realize they can manage with NRT and potentially get rid of their cigarettes. With the Quit Card, my patients would have their family members resource the NRT from the pharmacy prior to discharge so they would have the intervention available to them as soon as they returned home. Without the Quit Card, there was lack of incentive to continue with smoking interventions. Often the opportunity to change the patients smoking status would be lost as there was no ongoing immediate support to continue with smoking cessation when they returned home. This is key. If we are going to promote the message in hospital with smoke free property and this is the best thing you can do for your health...we are failing them without being able to provide the continuation of support in the community.

The Quit Card campaign definitely changed the conversation for me and my patients. I hope it carries forward to give us the tool to help people quit smoking and reduce costly visits to hospital for smoking related illnesses.

[Respondent 9] It is very difficult without quit cards to assist patients. Cost of NRT is a huge barrier to quitting in our patient population. We are able to provide NRT while the patient is in hospital, but after their short stay we need the quit cards if we expect the patient to continue to abstain. The freedom and flexibility of the quit cards is very helpful.

The patient can choose which type of NRT will work for them and are not required to stick to a cookie cutter approach like other programs (ie pt can buy some patches, gum & spray vs only having access to 5 weeks of the patch). Smoking cessation needs to have an individualized approach, quit cards provide this.

[Respondent 10] While in hospital pt's who previously did not want to quit become more interested when they receive NRT in hospital. With the proper dosing the pt can experience smoke free (or decreased smoking) and often contemplate quitting. When offered the Quit Card it gives them a chance to continue with their tx as most pt's can't afford the cost of NRT

Staff have been excited to be able to provide patients with something to help them quit and if we are out of cards my email blows up!!

This program is wonderful and well received. I hope it can continue!

[Respondent 11] *It removes a hurdle of cost.*

Provides support to the patient in trying to help them quit.

[Respondent 12] *I have found that the Quit Card program has helped to remove smoking cessation barriers for many of the patients. Many low income patients resort to contraband cigarettes and cannot afford nicotine replacement therapy.*

For patients that smoke regular cigarettes, the card motivates them to try to quit. Due to the nature of the addiction, many of these patients are unable to differentiate the money they spend on cigarettes and nicotine replacement costs. Even though NRT is less expensive, patient experience fear of failure and are afraid to end up double paying for out of pocket NRT and cigarettes. Many fear that using their cigarette money to buy NRT might be wasted if they fail and that they cannot afford both.

[Respondent 13] *I had some amazing moments with people who were so grateful for the program, the financial support, that someone cared that they were trying to quit etc. I had people tell me stories of loved ones passing, of friends who are sick, and many other reasons for quitting. Everyone was thankful and I feel it was perfect timing with the hospital going smoke free... great staff support!*

[Respondent 14] *In my role, we provide a full initial smoking cessation consultation with recommendations regarding dosing of NRT and which NRT to use. being able to immediately provide a patient with a quit card to then purchase the recommended medication reinforces the importance of cessation. It allows the health care provider to maximize the teachable moment. Furthermore, we provide an opt-out approach to follow up and enroll all our patients in the Ottawa Model IVRS to provide the greatest chance of cessation success.*

I have had patients hug me, offer to pay for part of the Quit Card and break down into tears as they felt this was the first time someone actually cared enough to help them be successful by providing the means to have a good start.

With my population of patients who are attending hospital visits and loss of income, they cannot afford to pay for NRT - the QuitCard helps to offset the costs while waiting to access community programs.

[Respondent 15] *I have seen great benefits with using the Quit Cards. I am a current pharmacy student and was able to be a part of this wonderful program. On my previous placement, I was in a community pharmacy. Working in the community, I saw many patients come in with the Quit Card. These patients were thrilled about this program and got many smoking cessation aids and ultimately achieved their goal of quitting. Quit Cards allows many individuals who are struggling to quit an excellent chance. There are many costs associated with smoking*

cessation aids, especially if you try many out before finding the one that works for you. Even though we explain to patients that when you quit you will save lots of money and this can go towards NRT, they only see the upfront costs initially.

Providing them with a Quit Card takes down this barrier and allows them to start their path to quitting smoking.

This program is excellent and I believe more funding should be used to support it. If we help more individuals quit smoking, this will only positively impact the healthcare system.

[Respondent 16] *The use of Quit card has been very helpful in patients getting started towards their Quit Smoking process. When patients are seen in urgent care clinics, they are often not followed up. Often the health care provider will talk about the quit smoking process, work together with patients to identify appropriate NRT and dosage and refer to appropriate quit smoking programs as needed. Having the quit card gives us the ability to go one step further and help them towards starting their quit smoking process.*

Patients are more likely to go and pick up NRT, especially if they don't have coverage for NRT from employer or other resources.

For those that have always thought about quitting, but have not started, this gives them an incentive to get started.

Having \$300 allows the patient to go back and try a different short acting NRT if they did not like the initial one.

In addition to the \$300, they also have follow up phone call support which is really helpful.

Overall It has been a great benefit to the patients we see in our clinic and to help them towards quitting smoking.

[Respondent 17] *The quit cards are a very effective means of promoting smoking cessation, re-invigorating patient efforts, and offering sustainable support. It can completely transform a patient's interest in quitting from "thinking about it" to "ready to try now". For health care providers, it means not just talking about combo NRT, but deciding on concrete doses, titration, and a complete review of options in addition to establishing telephone follow up support. These cards have been instrumental in helping more smokers in our clinic become smoke free.*

Table B: Have you had any challenges with the Quit Cards or the Quit Card program?

<p>[Respondent 1] <i>The only challenges we've had is around some pharmacies not accepting the cards or only offering name brand NRT. I have not heard too many issues, but these re a few thing that have come to my attention.</i></p> <p><i>The expiry dates also cause issues when trying to instruct patients that they must pick up the product within a week, even though they have not yet been discharged.</i></p>
<p>[Respondent 2] <i>None whatsoever</i></p>
<p>[Respondent 3] <i>The gap between cards and quick expiry date.</i></p> <p><i>Some pharmacies did not recognize them and gave patients a hard time about using them.</i></p> <p><i>Some pharmacies did not have adequate supplies to fill them with.</i></p>
<p>[Respondent 4] <i>yes - some recipients reported that they had trouble getting their pharmacist to provide them with the amount of NRT they needed. We encouraged people to get all of the NRT they needed in one visit, to avoid paying the dispensing fee more than once, and to use the value of the card before it expired. When issued in "batches" of various expiry dates, we found that one set of cards was about to expire in days and the next batch had not been issued. This was problematic in both getting the cards to the staff in charge of dispensing them as well as giving a hospitalized patient a card that is about to expire quite likely while they are still in hospital. It would be beneficial to have the subsequent batch of cards available and ready to put into circulation a week before the previous batch expires.</i></p>
<p>[Respondent 5] <i>The challenges was time:</i></p> <p><i>a) the hospital was not given enough time to set up how we would give the cards to patients in-house. We had very little time to put a process together given our acute hospital is very large and busy.</i></p> <p><i>b) why do these cards expire & the expiry date is very close? Patients need more time to recover after being in hospital unlikely to have the energy to find a drug store and redeem the card right away. Maybe, give 6 months expiry date?</i></p>
<p>[Respondent 6] <i>The time needed to gather the information, add to the data base and re-explain to the person was a bit long.</i></p> <p><i>I can appreciate that the benefits for the folks who receive the cards outweigh the burden to me :)</i></p>

[Respondent 7] *The two challenges that were barriers to using the program were:*

1. pharmacies lack of knowledge and support for the program. I received many messages from patients stating their pharmacy would not release everything they needed or at the levels recommended by the hospital for NRT.

Example: needing 42mg NRT per day plus supplement of inhaler, gum etc. Some pharmacies would not support that model and only release 21mg.

2. The expiry date. Giving out a card that expires in 1 week provides challenges for the patient to purchase all they need for the 10-12 weeks of their smoking cessation program. Some pharmacists would not release bulk purchases and patients felt they could not continue with the program based on receiving only 1 week of NRT. And not being able to use the card after the expiry date.

[Respondent 8] *Quit cards expiring so soon to when the patient receives them. We hand out the quit cards until the day they expire so near the deadline I'm often telling patients to 'stock up' on NRT because they may only have a few days to spend the money. An expiry date attached to when the patient receives it would be more helpful (ie patient has 3 months from date of discharge to use it)*

[Respondent 9] *The challenges within a large organization are the distribution and tracking of cards. I have not even been able to distribute to all areas/units.*

Staff compliance to process in card distribution has presented problems. Despite education through huddles emails etc staff on units make errors that require investigation. I find they are better managed when 1 or 2 people do it (ie specific programs that have minimal staff like out pt programs) vs units where there are rotating staff -full time /part time/casual/ward clerk and nurses. The process is different so too many hands in the pot increases the chances of error. That being said I am rethinking process for distribution

[Respondent 10] *My clinic availability only allowed me 1-2 days a week to consult the patient and offer the quit cards. I'm the only person doing the consultations therefor only person to distribute the cards. We could of had a better outcome of distributing the cards if more staff was involved.*

Also not every pharmacy accepted these cards. Especially the Quebec Pharmacies.

[Respondent 11] *I have found that the biggest challenge with the Quit Card program is at the community pharmacy/drug store level. Many community pharmacists do not know how to use the card properly. Some try to get patients to return weekly for nicotine replacement. Unfortunately, this "eats up" into patient's medications with repeated dispensing fees.*

[Respondent 12] *Some people found the registration process tricky the first round. Although less money the second round, I think it was still smoother for people and less complicated.*

[Respondent 13] *Absolutely none - the program desperately needs to continue.*

[Respondent 14] *NO*

[Respondent 15] *No challenge associated with the card itself as it is very easy to use. The only challenge is starting up the conversation with a patient around smoking cessation.*

[Respondent 16] *No major challenges.*

Few questions that have been asked by patients, are how often are the follow up calls made and am I able to fill up the prescription all at once?

[Respondent 17] *None. It has been seamless.*