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Boosting efficacy of nurse-led stop smoking interventions with a quit and win contest: pilot study results
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Background: Grave disparities in smoking prevalence exist between indigenous Māori, Pacific Island peoples, and other New Zealanders. Primary care nurses routinely provide brief stop smoking interventions to achieve national targets but they are constrained by time. Innovations using new technologies offer opportunities to enhance brief interventions and improve uptake and outcomes.

Objectives/Aims/Hypotheses: This study explored the feasibility of adding a novel scratch card and internet-based, quit and win contest with mobile phone support messages, to practice nurses’ brief smoking cessation interventions.

Design: Pragmatic exploratory mixed methods pilot study comprising a quantitative two-group comparison and qualitative interviews.

Methods: In two intervention clinics, practice nurses added supportive mobile phone messages, novelty scratch cards to win online prizes and $1000 prize draw entry following 1 month smokefree, to routine brief stop smoking interventions. In three control clinics, patients who smoked received brief stop smoking interventions only. Practice nurses collected baseline and 1-month data describing patients’ smoking status, quit attempts, and cessation support. Researchers conducted qualitative interviews with two nurses and ten patients and collected 3-month data.

Results: Five primary care clinics recruited 67 smokers (37 intervention; 30 control). The contest was readily incorporated into nurses’ practice. It appealed to nurses and Māori and Pacific Island patients, increased time to first cigarette, and attracted first time quitters. However, it had no extra effect on smoking cessation compared with usual care. Pacific Island patients’ participation in the online elements was limited by low access to the internet.

Conclusions: While the exploratory study did not indicate the potential for triggering mass quitting, reduced dependency was suggested. The intervention attracted Māori and Pacific Island smokers and engaged first time quitters. Low cost, novelty activities could be used to refresh routine brief stop smoking interventions, and to motivate practice nurses to engage more smokers in quitting.

Keywords: smoking cessation; quit and win; nurses; primary care; indigenous

Impact statement
Enhancing routine nurse stop smoking interventions can boost their involvement and promote quit attempts among indigenous and minority group smokers.

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Introduction

Nurse stop smoking practice can increase quit rates among those who smoke. A Cochrane review of nurses and smoking cessation interventions concluded that general practitioner (GP) and nurse smoking cessation non-hospital based interventions were effective and cost-effective in the short-term (Rice, Hartmann-Boyce, & Stead, 2013). They were more effective if delivered independently versus as part of an overall health check and nurse smoking cessation interventions were more effective for those motivated to quit rather than for all patients who smoked. Better initial and ongoing engagement may improve quit rates (Zwar et al., 2015).

Including smoking cessation in everyday nurse practice is challenging. Lack of funding, time and workload pressures, low nurse autonomy, lack of practice wide commitment, and problems with communications within practices and patient data management, have been identified as barriers to nurses implementing smoking cessation interventions in routine practice in New Zealand and elsewhere (Fuller, 2015; Halcomb et al., 2015; Pullon, Cornford, McLeod, de Silva, & Simpson, 2005). Gould, Pearce, and James (2000) note that lack of time allocated to normal consultations makes it difficult to add brief smoking cessation interventions, yet few patients are motivated enough to attend for stand-alone smoking specific help.

New Zealand’s (NZ) goal to become smokefree by 2025, that is reducing smoking prevalence to 5% or below, includes equitable reductions in smoking rates for indigenous Māori and Pacific Island peoples (New Zealand Government, 2011). Stark disparities in smoking prevalence exist between Māori (38%), Pacific Island peoples (25%) and other New Zealanders (15%) (Ministry of Health, 2015). Further, there has been no decline in smoking rates among Māori since 2006, despite a comprehensive tobacco control programme consistent with the Framework Convention Tobacco Control (FCTC) (Ministry of Health, 2014a, 2015). Young adults have higher smoking rates than other age groups but few interventions have been directed at this age group (Ministry of Health, 2012). Evidence suggests that most smokers would like to quit, with the Ministry of Health (2015) reporting that two out of three smokers had tried to quit for at least 24 hours in the past 12 months, and over half (58%) for at least a week. Innovative interventions to markedly increase quitting among Māori and Pacific Island adults and youth are needed.

A number of studies have demonstrated the benefit of providing practice nurses with training and support in brief smoking cessation interventions (Chan, Wong, & Lam, 2013; Halcomb et al., 2015). Chan et al. (2013) also found that training reduced nurses’ perception of client and system related barriers to risk factor management. Nurses are the largest health professional group in NZ (Ministry of Health, 2014b). In recognition of this, and to address low smoking cessation intervention rates by nurses, New Zealand’s (NZ) Ministry of Health (MoH) provides readily available, up-to-date ABC (Ask smoking status, give Brief advice, and refer to/provide Cessation support) training for all registered health professionals (Wong et al., 2007). Training includes prescribing “quit cards” to would-be quitters. Quit cards are a voucher that can be redeemed at any pharmacist for full government subsidised nicotine replacement therapy in the form of gum, lozenges and patches although the pharmacists’ prescription fees apply (currently $NZ5.00 [$US3.71] per product). In addition, other subsidised pharmacotherapies (varenicline, bupropion, nortriptyline), consistent with MoH guidelines, are available from nurse practitioners and any doctor (Ministry of Health, 2014c). MoH health targets have resulted in the high delivery of ABC in hospitals (95%) and primary care (90%) (Ministry of Health, 2016). Despite this, smoking rates are declining slowly and only among some groups. Both patients and smokefree coordinators who are also nurses identify communication barriers between nurses and patients who smoke, particularly describing routine tick box style delivery of ABC interventions (Smoke-free Nurses Aotearoa/New Zealand, 2014; Wong, 2014).
Quit and win contests were developed in the 1980s by the Minnesota Heart Health Program (MHHP) and have been widely used as a population-based smoking cessation intervention, though relapse rates at 12 months were high for the MHHP. A Cochrane Review of quit and win contests concluded that there are insufficient studies to draw firm conclusions about effectiveness (Cahill & Perara, 2011). Weaknesses in study designs included difficulties in designing controlled studies for population-based quit and win contests and deception levels among contestants. Workplace or clinic based studies are needed. While controlled trials suggest that quit and win contests may help some smokers to quit, they have little effect on community smoking rates. Fewer than one smoker in 500 quits.

A quasi-experimental quit and win study with approximately 500 participants in each group (control and intervention) resulted in a relatively high quit rate using both self-report and biochemical validation (urine sample) outcome measures. Follow-up at 3, 6 and 12 months after the study’s 30-day quit period for the intervention group found 2.6 times the odds of self-reported quitting, and 5.3 times the odds of biochemically validated quitting (Hahn et al., 2005). An NZ study focussing on Māori and Pacific people achieved high quit rates compared to national quit rates with a culturally appropriate quit and win team/group-based contest approach (Glover et al., 2014). Thomas et al. (2015) concluded that quit and win contests on college campuses were feasible, acceptable and result in high rates of initial abstinence among young adult smokers.

Given that NZ practice nurses already provide ABC, we wondered if efficacy could be boosted by adding a novel humorous competition. Although quit smoking competitions are not effective long term, the effect of incentives given by practice nurses, and on their attitudes to delivering behaviour change interventions, have not been investigated previously (Cahill & Perera, 2008). Humour between nurses and patients is important to developing relationships (Åstedt-Kurki, Isola, Tammentie, & Kervinen, 2001). We wondered if a humorously themed scratch card competition for prizes would encourage nurse participation and increase patient recruitment, including young adults.

The Cow Pat Quit and Win (CPQ&W) exploratory study investigated the feasibility of adding a novelty quit and win competition to routine, nurse-led smoking cessation in primary care clinics. CPQ&W used a scratch card format and online prize draw entry common in lotteries and commercial promotions. The cow pat theme was based on a funny rural fairground lottery – cow pat bingo in which a cow is led into a field marked with numbered squares. Fair attendees buy numbered tickets and the winner’s number is determined by where the cow drops her first pat.

Initially, we assessed the appeal of the cow pat bingo concept and website imagery with nurses and patients. The stakeholders were located through personal contacts with Māori, Pacific Island and European nurses, and young adult and adult Māori, Pacific Island and European smokers and ex-smokers. We used a semi-structured interview schedule to elicit their opinions in-person (recorded via notes) or email. In general, the cow pat bingo concept was considered funny. Some stakeholders knew of the contests from living in rural NZ. Three health professionals were concerned about juxtaposing excreta with a health promoting intervention. In particular, they thought that Pacific Island patients might be offended whereas Māori and Caucasian New Zealanders would identify with NZ as a rural nation. Two commented that “bingo” was gambling. This is not the case with CPQ&W because people have to quit smoking to enter the prize draw, not risk money. Some commented that the cow image was obese and out of keeping with a healthy message. As a result, the cow pat concept was retained as a low-key element in promotional material, the name of the contest became “Cow Pat Quit and Win” versus “Cow Pat Bingo”, and the cow’s dimensions were reduced.

Poulsen et al. (2015) claim there are few studies of the real-life effectiveness of daily practice smoking cessation activities from GP settings. This exploratory study aimed to (1) assess the feasibility of practice nurses adding CPQ&W to routine ABC interventions; (2) assess
acceptability to nurses and patients; and (3) obtain an indication of any effect on quit attempts and quit rates especially among Māori, Pacific Islanders and young smokers.

Methods

Study design
The design was a pragmatic mixed methods pilot study comprising a non-equivalent, two-group design with repeated measures in real-life conditions; qualitative interviews; and a review of study records. Pilot studies are used to determine the feasibility and acceptability of novel interventions (Whitehead, Sully, & Campbell, 2014). A limited evaluation of efficacy may contribute to assessing feasibility as is the case here (Bowen et al., 2009).

Ethics
Auckland University of Technology Ethics Committee granted approval (12.8.15, 15/244). Clinic settings, nurses and patients were provided information sheets and signed ethics approval forms.

Participants
We approached three Primary Health Organisations (PHOs) to locate interested general practices with high proportions of Māori and Pacific Island patients. PHOs are large networks of mainly GP health services (Ministry of Health, 2017). Interest in the intervention was high but the time needed to undertake research processes deterred participation. One PHO agreed to participate immediately and quickly located two practices; another approached suitable practices which declined to participate because they were busy with accreditation and other matters; the third located two interested clinics after 10 months during which the PHO research protocol request was processed. When approached, one clinic was very small, had few smokers and was too busy to manage study procedures (ethics, data collection and providing the intervention), and the other agreed to join the study.

Direct approaches were made to two GP practices. One declined because they did not feel the cow pat concept would be meaningful to their clientele (many migrants, refugees and Pacific Island clients), and the other agreed to participate. The health clinics of five tertiary institutions were approached. Three declined (busy or low numbers of Māori and Pacific Island students) and two agreed.

In summary, four GP practices and two tertiary education clinics, all with practice nurses and substantial proportions of Māori, Pacific Island, and young adult patients, located in or near Auckland New Zealand, agreed to participate. The sites were allocated to an intervention or control group alternating between intervention and control based on the order the sites confirmed participation in the study. The first, third and fifth clinics to confirm participation were allocated as intervention sites, while the second, fourth, and sixth sites became control sites. One tertiary clinic withdrew after unsuccessfully trying to recruit participants because the delay in recruiting GP practices meant that the study did not occur until just before the long summer break. This left two intervention sites and three control sites recruited over 10 months. The sole remaining tertiary clinic was a control site. The participants in the study were smokers aged 18 years and over who were enrolled at one of these participating practices. Eligible patients who did not want to participate at baseline were excluded from the study entirely.

In the intervention settings advertising included a large colourful CPQ&Win branded pull-up banner, branded posters and leaflets placed in the practice waiting rooms and one consultation
Control clinics were supplied with black and white text-only DL sized (110 × 220 mm) leaflets without graphics entitled “Help people stop smoking” and placed in their waiting rooms. In addition to the advertising prompting enquiries, nurses and one practice manager invited patients opportunistically. That is, if a patient confirmed they were a smoker during the routine ABC procedure, they would then be invited to participate in the study. In one intervention clinic and one control clinic nurses routinely phone patients to encourage and support quit attempts as part of their standardised ABC smoking cessation support process. In these clinics, the offer to participate in the study was added to the phone support being provided. Clinics were reimbursed for involvement. Three clinics received a fee per nurse/patient contact. The others (one intervention and one control) preferred to keep their carbon monoxide (CO) monitors in lieu of payment. The study ran from October 2015 to February 2016. Two would be participants were excluded because they were not currently smoking. One participant withdrew from the control group before 1 month follow-up. Other participants were lost to follow-up (n = 28) because they were either not contactable or did not respond to our follow-up phone messages.

**Procedures**

Intervention group participants were informed that they were participating in a study to see whether brief stop smoking interventions in primary care can be enhanced by using a fun contest. The intervention included a website which participants could access via computer or mobile phone. At baseline, the intervention group received scratch cards following ABC interventions. Scratching a blank panel on the card revealed motivational messages and access to a unique code giving the participants the opportunity to win spot prizes (redeemable on the CPQ&W website). The website included tips to quit smoking. Participants were mass-texted three support messages over three weeks to support their quit attempts. Text support has been found to be effective at increasing quit rates (Whittaker, McRobbie, Bullen, Rodgers, & Gu, 2016). At the four week follow-up, smokefree participants were entered into a $1000 online prize draw. Smokers received another ABC intervention at the end of the study and opportunities to win spot prizes on the website at the end of the study. Participants who were smokefree also received more opportunities to win prizes after the 12-week follow-up.

Like the intervention group, the control group was informed that they were participating in a study to see whether brief stop smoking interventions can be enhanced by using a fun contest. They received an ABC intervention at baseline and at the four week follow-up if they still smoked. At 12 weeks, they were texted or emailed one opportunity per data collection point to enter in the CPQ&W website and win spot prizes (Figure 1).

**Data collection and measures**

Practice nurses and one practice manager were trained in how to: explain the study to potential participants and ask for their consent to participate; collect data including exhaled carbon monoxide (CO) readings; and add the intervention to the usual ABC procedure they were already trained in. At baseline and 1 month, they collected participants’ ages, gender and ethnicity; smoking status and time to first cigarette as a measure of addiction (Chen et al., 2002); and quitting behaviour (previous quit attempts, pharmacological and behavioural support, reasons for quitting). Self-reported smoking status was measured using New Zealand standardised primary care questions: number of cigarettes smoked in the past two weeks (Ministry of Health, 2011). Not smoking was defined as “not a single puff” and verified if possible using Bedfont CO Smokerlyzers at ≤6 ppm (Middleton & Morice, 2000). None of the clinics had used CO monitors before. Nurses reported their completion of ABC and study steps. Researchers (GW, MMcP)
collected 1-month data if patients did not present at clinics, and all 3-month data, by phone. We maintained records of the number of spot prize codes entered into the website.

For the qualitative component of the study, we used semi-structured interview schedules to conduct face-to-face interviews with lead nurses at each intervention site and to interview a purposive sample of intervention group patients, by phone. The purposive sample sought a mix of young and older Māori, Pacific and European men and women, and successful and unsuccessful quitters. We invited the patient participants to describe their experiences of participating in the intervention, its effect on their smoking, and for suggestions to improve it. Nurses were asked about their experiences especially with regard to communicating about smoking cessation with patients and fitting the intervention into their daily workload. All interviews were audio-recorded.

**Data analysis**

Quantitative data were entered into SPSS. Group differences were tested on an intention-to-treat basis using Chi-square or Fishers Exact Test for categorical variables, and ANOVA for interval variables. Records of online spot prize draw code entries were totalled.

Qualitative data were transcribed by two researchers and, together with study records data, analysed using thematic inductive analysis (Thomas, 2006). Transcripts were audited by other research team members who read the transcripts to confirm the themes.

**Results**

The five study sites which participated recruited 69 patients. Two people were excluded from participating because they did not meet the inclusion criteria for smoking, resulting in 37 participants from intervention clinics and 31 from control clinics. The follow-up rates were similar for intervention and control groups at 69% at 1 month (n = 26 intervention; n = 20 control), and 57% at 3 months (n = 22 intervention; n = 17 control) (Figure 1).

At baseline, the groups differed significantly on ethnicity only. The intervention group was 70% Pacific Island compared with 13% of the control group (Table 1). At 3 months, the intervention group was 77% Pacific Island compared with 0% of the control group.

At baseline, 20% of participants had made no quit attempts in the past 12 months. Nine participants (13%) were first-time quitters. There were more first time quitters in the intervention
group than the control group. At one intervention clinic, 30% of participants made their first quit attempt.

There was no difference in self-reported quit rates between the intervention and control groups at one month (13%) and three months (16%). Across all participants, there was an increase in quit rates between 1 and 3 months (Table 2). One month CO verification was not available for two-thirds of the smokefree participants as not all participants returned to their GP clinic for CO verification and these participants were followed up by phone. CO verified results supported self-reported data.

NZ Europeans overall had higher quit rates (20%) than Māori (12%) or Pacific Islanders at one month (10%), and at three months (European 25%; Māori 12%; Pacific Islanders 13%) (Table 2). Pacific Island patients were more likely than Europeans to relapse between follow-ups (p < .01).

There were no significant differences in quit rates for previous quitters compared with first time quitters at either follow-up. The proportion smoking their first cigarette within 30 minutes of waking declined from 59% to 14% over the study period. The proportion smoking their first cigarette more than 60 minutes after waking increased from 26% to 54%.

There were no group differences in nurse provision of ABC. Over 95% provided brief advice and an offer of support to quit; about 33% provided access to NRT; 15% provided access to other forms of support. At one month, more control group patients (n = 6) used varenicline than intervention patients (n = 2) (p < .05). However, there were no statistically significant outcomes between varenicline use and quitting. There were no group differences in patients using NRT (intervention 27%; control 37%) or behavioural support (intervention 19%; control 26%) at one month.

Table 1. Baseline characteristics.

<table>
<thead>
<tr>
<th></th>
<th>Intervention n (%)</th>
<th>Control n (%)</th>
<th>Total n (%)</th>
<th>Sig.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gender</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Male</td>
<td>17 (46)</td>
<td>12 (40)</td>
<td>29 (43)</td>
<td>n.s.</td>
</tr>
<tr>
<td>Female</td>
<td>20 (54)</td>
<td>18 (60)</td>
<td>38 (57)</td>
<td>n.s.</td>
</tr>
<tr>
<td>Age (years)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mean</td>
<td>40</td>
<td>44</td>
<td>42</td>
<td>n.s.</td>
</tr>
<tr>
<td>Range</td>
<td>21–79</td>
<td>20–70</td>
<td>20–79</td>
<td>n.s.</td>
</tr>
<tr>
<td>Ethnicity</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>NZ European</td>
<td>5 (14)</td>
<td>15 (50)</td>
<td>20 (30)</td>
<td>n.s.</td>
</tr>
<tr>
<td>Māori</td>
<td>6 (16)</td>
<td>11 (37)</td>
<td>17 (25)</td>
<td>n.s.</td>
</tr>
<tr>
<td>Pacific Island</td>
<td>26 (70)</td>
<td>4 (13)</td>
<td>30 (45)</td>
<td>p &lt; 0.5</td>
</tr>
<tr>
<td>Total</td>
<td>37</td>
<td>30</td>
<td>67</td>
<td></td>
</tr>
</tbody>
</table>

Table 2. Quit rates by ethnicity (n = 67).

<table>
<thead>
<tr>
<th></th>
<th>Four weeks</th>
<th>Twelve weeks</th>
</tr>
</thead>
<tbody>
<tr>
<td>NZ European</td>
<td>20</td>
<td>25</td>
</tr>
<tr>
<td>Māori</td>
<td>12</td>
<td>12</td>
</tr>
<tr>
<td>Pacific Island</td>
<td>10</td>
<td>13</td>
</tr>
<tr>
<td>Total</td>
<td>13</td>
<td>16</td>
</tr>
</tbody>
</table>
At one month follow-up the main reasons selected for stopping smoking during the Quit&Win competition for both intervention and control groups were “For my own health”, followed by “For my children”, and “It was time to stop”. Three intervention group participants selected “Because I want to win this competition”.

Qualitative results; results of records review

Ten phone interviews were conducted with purposively selected patients from the two intervention clinics after the $1000 prize draw (Table 3). We aimed to interview a range of younger and older Maori, Pacific Island and European smokers and ex-smokers. The interviews ranged from 10 to 25 minutes long. Interviews were conducted with the two practice nurses who led the roll out of the study in the intervention settings.

Perceptions of CPQ&W

There was support for the intervention overall. Participants found that the CPQ&W enhanced communication between nurses and patients as an icebreaker and by improving communication about smoking. The intervention was motivating and an incentive to stop smoking. Usual care was enhanced, with text messages supporting patients and prompting quit attempts (Table 4). The CO monitors motivated participants to reduce their CO levels because they had evidence of their levels of smoking and progress towards smokefree CO reading. The nurses commented on the interest patients took in this process and their results. One nurse used the CO monitor to engage patients in the study.

Feasibility of quit and win contests

Interviews with participants explored the feasibility of adding a novel scratch card and internet-based, quit and win contest with mobile phone support messages, to practice nurses’ brief smoking cessation interventions. All of the patient participants supported quit and win contests, especially via primary care. They thought they would appeal to a wide range of people but especially younger ones because of the online element and the competitions. They were prepared to recommend it to family and friends. The nurses also supported delivering the contest.

Intervention processes: scratch cards, mobile phones, internet, website and CO monitoring

Both nurses found the quit and win contest process easy to explain including how to use the CPQ&W scratch cards. The interview participants all received scratch cards but few commented

<table>
<thead>
<tr>
<th>Table 3. Patient interviews – demographic description (n = 10).</th>
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<tbody>
<tr>
<td><strong>n</strong></td>
</tr>
<tr>
<td>Ethnicity</td>
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<td></td>
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<tr>
<td></td>
</tr>
<tr>
<td>Gender</td>
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<tr>
<td>Age</td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td>Smoking status</td>
</tr>
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</table>
Participants had different levels of access to mobile phones, computers, and hence to the website and prize draw entry, and texted support messages. Some were not able to go online at all. At one clinic, the practice nurse entered the spot prize codes for some patients during her consultations. About half of the prize draw codes given to participants ($n = 78, 51\%$) were entered into the website. The nurses and two Pacific Island patients said that limited mobile phone and internet access reduced patient participation.

One nurse mentioned that most of their patients were older and that this was a factor as they did not know how to use the internet. Nurses and patients felt that prizes and mobile technology would appeal to young people. Two interview participants, aged less than 30 years, found mobile phone access, and the website, easy to negotiate. They accessed the website readily, using their mobile phones. All participants who used the website found it straight-forward. Those without internet access wanted spot prizes to be given immediately in the clinics.

<table>
<thead>
<tr>
<th>Table 4. Themes.</th>
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<tbody>
<tr>
<td>A communication tool</td>
<td>An icebreaker</td>
</tr>
<tr>
<td>Improving communication about smoking</td>
<td></td>
</tr>
<tr>
<td>An incentive to quit</td>
<td>Wanting to quit</td>
</tr>
<tr>
<td>Wanting to win</td>
<td></td>
</tr>
<tr>
<td>Motivating</td>
<td></td>
</tr>
<tr>
<td>Enhanced usual care</td>
<td>Ongoing support/supportive</td>
</tr>
<tr>
<td>Prompt to keep making quit attempts</td>
<td></td>
</tr>
<tr>
<td>Motivational CO monitoring</td>
<td></td>
</tr>
<tr>
<td>Changed nursing focus</td>
<td></td>
</tr>
</tbody>
</table>

- **It did help, yes. I feel you needed something to just give them that little push. It was like you could give them something.** (Nurse)
- **When I’ve been in there with my asthma, like last year, they never paid attention like to my health, cos they just ask how much you smoke, write it down on a piece of paper, and they’re like ok, wait over here for the doctor. Whereas when they showed me the contest, she took her time to explain it and what harm it can do … … …and stuff like that.** (Participant)
- **It gave them the incentive to quit, but funnily enough that didn’t really – I think wanting to quit was more important to them, you know.** (Nurse)
- **Specially since it was near Xmas so sort of setting my eyes to that $1,000 …** (Participant)
- **I thought was it was cool. I thought you know it’s an incentive, a great incentive for a lot of people to give up, so yeah, I thought it was a great idea.** (Participant)
- **For me seeing that cow just helped me buck up my ideas too because I was trying to give up earlier but never picked up my guts to do it.** (Participant)
- **Those text messages that came every now and then really helped and always reminded me to take my (stop smoking) medications.** (Participant)
- **I kinda like a reminder, even though I wasn’t smokefree at the time, you know I’d go a couple of days and then I would trip up and then I’d get the text and I’d oh yeah. Back on the wagon.** (Participant)
- **I was so embarrassed and then alarmed at the red light, the red light was there, and it was over the limit the carbon dioxide, yeah yeah, and then that gave me fright, it gave me a shock. I need to do something about this.** (Participant)
- **Well I think in order to get them to quit or be successful you have to do the motivational thing (but prior to the CPQ&W study) I’d just head straight to the patching them (by providing an NRT Quit Card).** (Nurse)
Participants who received the texted support messages appreciated getting these, whether they were smokefree or not. There was support for longer follow-up with text messages.

Research processes
Nurses identified that participating in the study meant that they focused on study clients and gave more in-depth consultations than a standard brief intervention. They noted that the time taken to complete the research documentation was a barrier (Table 5). One month follow-up was difficult because participant contact details were inaccurate or changed. Another barrier was the busy nature of one setting where emergencies and un-booked patients took precedence over recruiting or following up study participants.

Discussion
The CPQ&W contest was feasible and acceptable in that it was readily incorporated into practice nurses’ brief stop smoking interventions. It appealed to nurses and Māori and Pacific Island patients and attracted first-time quitters. The pilot quit rates were within the range found in a review of Quit and Win studies (Cahill & Perara, 2011), but adding the novelty prize draw had no additional effect to nurses’ usual brief intervention practice.

The small sample size is a limitation of the study. Attrition rates in studies included in the Cochrane review of smoking cessation interventions by nurses varied from zero (a workplace study) to between 7%-33% (derived from individual study characteristics). While they were overall considered to pose relatively low (55%) or unclear (39%) risk of bias, this study had a very small sample (Rice et al., 2013). The differences in ethnicity between control and intervention groups are a further limitation of this study. The control group had more Europeans and fewer Pacific Islanders than the intervention group. This may have contributed to the null outcome. Pacific Island peoples have been found to have lower quit rates than European in age-adjusted comparisons (Ministry of Health, 2015).

Further limitations of the study are the unbalanced allocation of clinics to intervention control, with the control group only including a tertiary education health clinic; the Hawthorne effect on both intervention and control groups of participating in the research study with more time than usual spent on smoking cessation; and the CO monitor testing. The motivating effect of CO monitoring has been noted in a qualitative study previously (Grant, Ashton, & Phillips, 2015).
A further issue is the reliability of self-reported quitting. A study cited in the Cochrane Review comparing results from self-report versus biochemical validation found self-report exaggerated quitting by a factor of more than 3 in the intervention group and more than 15 for controls (Cahill & Perara, 2011). While the self-reported quit rate for the intervention group was reasonably stable through a twelve month follow-up, the biochemically validated rates halved, from 14% at 3 months to 7% at 12 months (Hahn et al., 2005).

The pilot demonstrates the challenges of undertaking research in real world settings. Few young adults were recruited because the study coincided with student holidays. Lack of time for primary care nurses for smoking cessation and data collection was reported in other studies in NZ (Pullon et al., 2005), Australia (Halcomb et al., 2015), and the United States (Aspy et al., 2008). Problems with internet access may have reduced the impact of the intervention, and discouraged fuller participation. Interview participants identified that low levels of internet access among Pacific Island and older participants reduced access to texted support messages and the prize draw entry. Māori (Statistics New Zealand, 2013) and Pacific Island peoples have relatively low internet access (Gibson, Miller, Smith, Bell, & Crothers, 2013). It is possible that brief evidence-based cessation interventions are optimal in NZ, and CPQ&W could not add to their effect.

While the humour of the cow pat theme was useful when recruiting clinics, it went unnoticed by the practice nurses and by urban participants, possibly because the joke was de-emphasised on study materials following formative evaluation. More salient themes such as a rugby-based “spot-the-ball” competition and more attractive, higher valued prizes could be more acceptable. Electronic cigarettes as prizes might appeal to young smokers in countries where they are recommended to support quitting. A New Zealand survey of 18–28-year-old smokers found that 50% intended to use them for future quit attempts (Guiney, Li, & Walton, 2015). Electronic nicotine delivery devices, nicotine vaping liquid and other harm reduced non-combustible tobacco and nicotine products are legally available in retail shops in New Zealand (Ministry of Health, 2018). In common with the National Health Service, England, the NZ Ministry of Health encourages stop smoking services to support people who want to quit smoking using vaping products, for example in combination with other stop smoking products and strategies which have been ineffective (McNeill, Brose, Calder, Bauld, & Robson, 2018). The Ministry believes that “vaping products have the potential to make a contribution to the Smokefree 2025 goal and could disrupt the significant inequities that are present” (Ministry of Health, 2018). Vaping complements existing population-based primary care stop smoking initiatives which need to be maintained.

While our pilot study does not indicate the potential for triggering large scale quitting, it suggests that the intervention reduced dependency on smoking among participants. One strength is that Māori and Pacific Island smokers (in common with Glover et al., 2014), and first time quitters were attracted to enrol. The qualitative results particularly support providing low cost, quick to administer, novelty activities to refresh routine brief stop smoking interventions, generate more quit attempts, and increase practice nurses’ engagement with helping patients quit. CPQ&W may have supported the patients who quit by refreshing the standardised smoking cessation interventions delivered by the practice nurses. The nurses had something tangible to give patients by way of scratch cards, as well as chances to win prizes and CO monitors which provided opportunities to engage, encourage, educate and monitor patients and their progress objectively over time. Care must be taken to meet the needs of those who are already disadvantaged by accommodating those with low internet access and by supporting computer literacy and the national digital strategies.

The findings support a larger properly powered study to test the efficacy of the scratch card quit and win concept, delivered by community nurses and other health professionals, and modified to accommodate low access to the internet. Further research is needed to determine optimal
prizes and their value, for engagement, for example, cash or sought after goods, and whether quit 
and win scratch cards can boost nurse engagement of young adults, indigenous and minority 
groups with high smoking prevalence. Further research about the efficacy of CO monitors as 
motivational tools used in brief routine health professional smoking cessation interventions is 
also warranted.

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