Feasibility and effectiveness of nurse-delivered smoking cessation counselling combined with nicotine replacement in Australian general practice

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Keywords
australian, general, replacement, nicotine, practisedارد_2, combined, feasibility, cessation counselling, smoking, nurse-delivered, effectiveness

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Abstract

Introduction and Aims. Practice nurses (PN) are an alternative workforce for cessation support in primary care, but their role and effectiveness is underdeveloped and underresearched. This study evaluated a model of smoking cessation intervention in Australian general practice based on PNs. Smokers were identified by their general practitioner (GP) and referred to the PN for cessation support over four counselling visits and offered free nicotine patches. Design and Methods. Pre- and post-study using mixed quantitative and qualitative methods. Cessation outcomes were collected by patient self-report at 6 months. Semistructured interviews were conducted with PNs and GPs to provide qualitative data on the acceptability of the model. Results. The project involved 31 PNs, 35 GPs and 498 patients from 19 general practices in Sydney. Mean age of participating patients was 46 years and 61% were female. Mean number of PN counselling visits was 3.1. At 6 month follow up the point prevalence abstinence rate was 22% and continuous abstinence rate was 16%. Participants who had attended for four or more counselling visits with the PN were significantly more likely to quit. PNs and GPs expressed enthusiasm for the PN role in smoking cessation and belief in its value and feasibility. Discussion and Conclusions. Substantial rates of cessation were found in this uncontrolled study and the role was well accepted by PNs and GPs. The model shows promise as a means of providing cessation support in Australian primary care and further research in a randomised trial is warranted.

Key words: general practice, practice nurse, nicotine replacement therapy.

Introduction

General practice has great potential for supporting smoking cessation. In countries with a developed primary care system, such as Australia, more than 80% of the population visits a general practitioner (GP) at least once a year [1]. There is clear evidence that smoking cessation advice from a physician has an effect and that this effect can be increased substantially if brief advice is combined with other evidence-based support, such as pharmacotherapy [2]. Translating this potential into sustained activity, however, has proved difficult. GPs have been encouraged to offer smoking cessation advice and support and some have attended training [3]. Despite this, the number of patients who report receiving advice on smoking cessation from GPs is low [4]. In an Australian study of GPs’ use of evidence-based approaches only 32% provided written materials and 28% set a quit date [5]. Barriers raised by GPs to engaging in greater efforts in smoking cessation include: perception of lack of effect; lack of GP time; lack of GP skills; reluctance to raise the issue due to perceived patient sensitivity about smoking; and perceived lack of patient motivation [6].

Alternative models to providing accessible smoking cessation support have been specialised referral services, such as the English Smoking Cessation Services. Evaluation of these services has shown validated 52 week abstinence rate of 15% [7]. Over time the English services moved more towards one-to-one
counselling (rather than group) and towards primary care rather than specialised settings. These changes occurred partially in response to consumer demand and the difficulty of organising groups [7,8].

An alternative model for enhanced smoking cessation support is provision of advice in the practice by general practice nurses (PN). Face-to-face support for smoking cessation provided within the practice may appeal to smokers given the accessibility and familiarity of the general practice setting. This may include smokers who are unlikely to use a telephone service, such as people from culturally and linguistically diverse backgrounds.

A number of studies have explored the effectiveness of PN interventions to support smoking cessation either as a standalone or multiple risk factor intervention, although none in the Australian context [9–17]. In a study by Vetter and Ford there was a significant benefit at 6 month follow up [11], another study demonstrated a reduction in smoking in those who were retained in the intervention [14] and a third study showed a significant reduction in cigarettes smoked per day [15]. All other studies showed no significant differences. Limitations of these studies included the low uptake of the nursing intervention [9] and intervention designs that provided only a one-off nurse consultation and a lack of follow up [10]. Additionally, there were low retention rates among smokers in these studies. The difficulties in retention of this group as study participants may have been responsible for the small effect sizes and lack of significance seen in some studies [18].

We conducted a study to develop the role and test the effectiveness of PN-delivered behavioural support plus free nicotine patches in the Australian primary care context. Australia has strong tobacco control policies [19] and low overall smoking prevalence with a rate of daily smoking of 16.6% (18.0% in men and 15.2% in women) [20]. Telephone Quitline services are provided nationally, but the only widely available face-to-face support for cessation is from generalist primary care services, such as GPs and community pharmacists. This study used mixed methods to examine not only the impact of PN support on cessation rates but also the feasibility and acceptability of the service model to patients, PNs and GPs.

### Design and methods

#### Study design

A pre–post study with 6 month follow up was conducted in two Divisions of General Practice (local GP organisations) in South West Sydney and a nearby rural area. All practices from these Divisions were invited to participate via a letter and notice in the Division newsletter. Practices were eligible if they had one or more PNs.

#### Intervention

Practice nurses were provided with a 4 h training program based on Australian clinical practice guidelines [2], which covered smoking cessation counselling, role of pharmacotherapy with a focus on use of nicotine replacement therapy (NRT) and project procedures. The nurses were provided with smoking cessation resources, including the guidelines and a counselling checklist designed for each patient visit. The initial training was followed by access to mentoring and support from the project officer (G. F.). The project officer also telephoned the nurses on a weekly basis and conducted regular practice visits to maintain contact and support. During a practice visit PNs were trained in the use of a Bedfont ED50 Smokelyser. The PNs took a leading role in providing counselling but were supported by the GPs and were also able to offer participants free nicotine patches. GPs identified smokers interested in quitting and referred these patients to the PN for a series of weekly counselling visits of approximately 30 min duration over a 4 week period. The activities at these visits are shown in Table 1. This schedule of weekly visits over 4 weeks was based on the English smoking treatment service model [7]. The nurses offered Quitline referral as a source of further support during the quit attempt. Patients attending the nurse could access an 8 week course of nicotine patches at no cost. Other pharmacotherapies were not subsidised by the project, but eligible patients could receive bupropion subsidised by the Pharmaceutical Benefits Scheme with a prescription from the GP.

#### Outcome measures

Quantitative measures of outcomes were measures of service utilisation and measures of smoking status. The

<table>
<thead>
<tr>
<th>Table 1. Intervention elements</th>
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<tr>
<td>Visit 1</td>
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<tr>
<td>Smoking assessment</td>
</tr>
<tr>
<td>Nicotine dependence assessment</td>
</tr>
<tr>
<td>Pharmacotherapy discussed</td>
</tr>
<tr>
<td>Nicotine patches provided</td>
</tr>
<tr>
<td>Quitline referral offered</td>
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<tr>
<td>Cessation counselling support</td>
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latter were self-reported point prevalence abstinence (no smoking in seven days preceding assessment) and continuous abstinence (no smoking from quit date to assessment) at 4 weeks and 6 months after the initial nurse visit. PNs were asked to measure exhaled carbon monoxide using a Bedfont EC50 Smokelyser at the 4 week and 6 month follow-up visits.

Participating patients were asked in the 6 month follow-up questionnaire for feedback on the smoking cessation support received from the PN. GPs and PNs were asked to take part in a semistructured interview face-to-face or by telephone to provide qualitative data on the service model.

Data analysis

SPSS version 16.0.1 (SPSS Inc, Chicago, IL, USA) was used for analysis of quantitative data. Descriptive analytical methods were used to analyse patients’ demographic characteristics, service utilisation, use of pharmacotherapies and measures of smoking status. To assess whether the number of nurse visits (less than four vs. four or more) was associated with smoking cessation cross-tabulation (2 × 2) was done and Pearson χ²-test was applied. The same method was used to assess whether patient nicotine dependence as measured by the Fagerström score (0–5 = low to medium dependence vs. >5 = high to very high dependence) was associated with success in cessation.

Thematic analysis was used to summarise the qualitative findings of the semistructured interviews [21]. Quotes were used to illustrate the participants’ views on key themes.

Results

Quantitative findings

Of a total of 89 practices in Macarthur Division and 19 in Southern Highlands there were 17 in Macarthur and seven in Southern Highlands who employed at least one PN and were therefore eligible to participate. Of these 12 (63%) from Macarthur and seven (100%) from Southern Highlands participated. The project involved 31 PNs and 35 GPs from the participating practices. Following PN training there was substantial use of the mentoring from the project officer with a total of 397 support contacts with the 31 PNs (mean 13, range 2–20).

A total of 498 patients attended the PN for an assessment visit and consented to take part in the project. Of these 344 (69.1%) completed the 4 week and 378 (75.9%) the 6 month follow-up assessments. The mean age of the 498 patients recruited at baseline was 46.4 (range 18–62) and 61.2% were female. The mean number of cigarettes smoked per day by the participants was 24.1 (SD: 10.5) and the mean duration of smoking was 29.8 years (SD: 13.1). According to the Fagerström score 43.6% of the participants had nicotine dependency level of very low to medium (score: 0–5) and for 54.4% the dependency level was high to very high (score: 6+). Less than half (44.2%) of the participants mentioned that they lived with a smoker.

The mean number of PN counselling visits over the first 4 weeks was 3.1 (range 1–7) while the mean number of GP visits was 0.3 (range 0–5). GP visits could have been for any reason and not necessarily related to smoking cessation. Most participants in the intervention either did not use the NSW Quitline at all (54%) or only once (17%), but it was used two or more times by a significant minority (30%). Overall 494 (99%) participants chose to use pharmacotherapy. The most popular choice was NRT (474, 95%) followed by bupropion (14, 3%). Choice of drug was not recorded for 6 (1%) of participants. The most common form of NRT was patch (368; 74% of participants). One hundred and six participants (21%) chose to use combination NRT. At the 6 month follow-up point 374 participants reported actually using NRT (mean duration of use 6.2 weeks) and 14 participants reported using bupropion (mean duration of use 6.6 weeks).

Point prevalence and continuous abstinence rates at 4 week and 6 month follow-up points are shown in Table 2. Participants lost to follow up were assumed to be continuing smokers. Because of difficulties with availability of Smokelysers, expired carbon monoxide validation of smoking status was not carried out in a substantial number of patients. The details of participants tested are shown in Table 2. Participants who attended for four or more consultations with PNs had significantly higher cessation rates at 6 months than participants who attended less than four times: point prevalence abstinence 32% versus 9% (P < 0.0001), continuous abstinence 25% versus 3% (P < 0.0001). Participants with very low to medium nicotine dependence (0–5 on Fagerström Score) had significantly higher point prevalence cessation rates than those with high to very high dependence (score >5); point prevalence abstinence 36% versus 21% (P < 0.001). However, continuous abstinence was not significantly different between these groups: 23% versus 17% (P < 0.163).

The use of NRT for the recommended duration (8 weeks) did not show any significant impact on point prevalence and continuous abstinence rates. Among participants who used NRT for 8 weeks or more the point prevalence abstinence rate was 30.5% compared with 25.0% who used NRT for less than 8 weeks (P > 0.05). Among participants who used NRT for...
8 weeks or more the continuous abstinence rate was 21.8% compared with 17.2% who used NRT for less than 8 weeks ($P > 0.05$).

Participating patients were asked in the 6 month follow-up questionnaire for feedback on the smoking cessation support received from the PN. Of 391 participants who responded 385 (98%) rated the support provided as helpful (19%) or very helpful (79%). Participants were asked what could have made the quit attempt easier or more successful. Of the 362 responses to this question less than 2% commented that the program could have been improved and all of these comments indicated that they may have been more successful if they had been able to have more sessions with the PN.

### Qualitative findings

Qualitative evaluation of the intervention model through semistructured interviews was conducted with PNs and GPs. Semistructured interviews with 21 PNs and 11 GPs were completed before saturation of themes was achieved and no new themes were emerging. The qualitative data were grouped into themes to report the findings. These were: perceived value of the role; barriers to PNs taking on this role; resources provided to support the role; and sustainability issues.

All the PNs interviewed were enthusiastic about the role, thought it enhanced their skills and that it expanded their scope of practice. They also thought it was an appropriate role for PNs, which could benefit patients.

... enhances the role as Practice Nurse. Adds to depth of skills. Satisfying to help people quit smoking PN

(PN) really in charge... often not (previously) given enough scope as PNs—PN

One-third of the PNs volunteered the opinion that PNs have more time than GPs available for this kind of counselling. Some PNs believed that patients feel particularly comfortable with the nurse.

Patients are... more relaxed and open with the Practice Nurse—PN

Patients were very open to having the nurse not the doctor—PN

Finding time in their day that could be dedicated to the role of smoking cessation counsellor, and quarantined from other tasks, was the major barrier identified. The majority of PNs thought a longer training program was needed. The telephone mentoring and support from the project officer was highly valued.

Had never done it before—a lot to absorb in half a day—PN

Good to have support because it was a new area of work—PN

The PNs gave positive feedback on the resources provided, in particular, the clinical practice guidelines, but were less positive about the support provided to patients by the Quitline. More than half of the PNs reported that patients had experienced difficulties using the Quitline service. Some PNs reported that patients preferred the face-to-face contact with the PN to a telephone call from an ‘anonymous’ person. On the other hand some PNs reported receiving positive comments from patients about the Quitline stating that patients valued the service and found it reliable. The provision of free NRT patches was seen as a major factor in motivating patients to make a quit attempt and in improving adherence and cessation outcomes.

Huge incentive... really attracted people—PN

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**Table 2. Smoking status and CO validation results at 4 week and 6 month follow up**

<table>
<thead>
<tr>
<th>Smoking status</th>
<th>4 weeks ($n = 344$)</th>
<th>6 months ($n = 378$)</th>
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<tr>
<td>As stated by participant</td>
<td>As validated by Smokelysera</td>
<td>As stated by participant</td>
</tr>
<tr>
<td>Not smoked in last 7 days (point prevalence)</td>
<td>195 (39.2% of 498 participants at baseline)</td>
<td>Not smoked = 154 participants at baseline</td>
</tr>
<tr>
<td>Not smoked since quit day (continuous abstinence)</td>
<td>129 (25.9% of 498 participants at baseline)</td>
<td>Not tested = 34 participants at baseline</td>
</tr>
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</table>

*Expired CO of >10 ppm was taken as indicating possible continuation of smoking.*
If paying they would not have stayed on patches for the whole 8 weeks—PN

Key issues in sustainability were remuneration for PN consultations and access to training and support. Very similar themes emerged from the GP interviews. GPs expressed positive views about the value of offering a quit smoking service in the practice. They saw it as a suitable role for PNs and welcomed the PN involvement. Again the major barrier was PN time.

An excellent program that has potentially save many lives—GP
It reinforced they could get help in the surgery even if they didn’t quit.—GP
It fits with the nursing role. The autonomy suited the nurses.—GP
Very time-consuming for PNs although the practice was willing to accommodate this because it was good for patients . . . —GP

All the GPs interviewed thought an on-going funding mechanism was essential if the role was to be sustained.

If we had a Medicare item number we could refer all our patients wanting to quit to them.—GP

Discussion
The study showed positive outcomes in terms of cessation rates. The 6 month point prevalence cessation rate at 6 months of 21% is not directly comparable to the outcome of the English Smoking Cessation Services as the evaluation of those services reports 12 month outcomes. However, if adjusted for a relapse rate of 0.27 between 6 months and 12 months [22], the estimated 12 month self-reported point prevalence cessation rate in this study is 15%. This is the same rate as the validated 52 week abstinence rate of 15% reported by the English Smoking Cessation Services. Smoking rates are lower in Australia so the context is different, but this study suggests that a primary care-based PN-led model may be as effective in the Australian context as the English services have been in the context of the British health system and population. The quit rates reported also compare favourably with the outcomes of physician advice and nurse advice reported in Cochrane reviews with the important proviso that those are meta-analyses of controlled trials [23,24]. Our positive findings in this uncontrolled study contrast with the lack of effect found in some randomised trials. As previously mentioned there were problems in the controlled trials with low uptake of the intervention and/or low rates of follow up [9,18], but clearly our intervention model needs to be tested in a randomised trial.

The patient follow-up questionnaire and the qualitative evaluation with PNs and GPs found that the service model was well supported by all parties. Both PNs and GPs thought the role was a suitable one to be taken on by PNs. The amount of training provided to PNs was limited to 4 h, and should be expanded in future studies. Perhaps as a consequence of the short duration of the training the telephone mentoring subsequently provided was extensively used by the PNs. This role may be less needed if training was expanded and could possibly be provided by a Quitline counselor, providing further integration between general practice smoking cessation support and the Quitline service.

Although the role was welcomed and is congruent with the expanding role of PNs in Australian general practice [25], it was clear that without an ongoing source of funding for PN consultation time the role could not be sustained. There are a number of possible funding mechanisms in the Australian context, including expanding the existing PN consultation items that can be claimed from Medicare by GPs for services provided by PNs on their behalf or through block funding for PNs.

The study has a number of limitations, the major one being the lack of a control group. The study does not therefore provide high-level evidence of the efficacy of cessation support from PNs, but the effect observed justifies further investigation in the form of a randomised trial. A further limitation is that it was not possible in the study to differentiate the effect of PN counselling from the effect of smoking cessation pharmacotherapy. The most widely used form of pharmacotherapy in the study was nicotine transdermal patches. In previous research nicotine patches have shown effect sizes of around 17% in controlled studies with 6 months to a year of follow up [26], but there have been concerns that success rates may not be as high in over the counter settings where support and follow up is not provided [27]. In such complex interventions with a number of interacting components [28] it can be difficult, if not impossible, to differentiate the effects of each component in quantitative terms. As we did in this study qualitative methods can be used to help understand the processes of the intervention. It would be important to include qualitative process evaluation in a controlled study of a PN intervention.

Conclusions
Practice nurse-supported cessation in combination with NRT produced cessation rates similar to special-
ised services and taking on this role was welcomed by both PNs and GPs. The model shows promise as a means of providing cessation support in Australian primary care and further research in a randomised trial is warranted.

Acknowledgements

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References