

To Cite: Siqueira LC. Are we missing an opportunity to improve smoking cessation rates for pregnant women? *JHD* 2017;2(3):19–22. <https://doi.org/10.21853/JHD.2017.31>

Corresponding Author:

Lizanne C Siqueira
101 Drummond St North
Ballarat, VIC 3350
Australia
lizanne.siqueira1@my.nd.edu.au

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SUMMARY

Anti-smoking public health campaigns targeting pregnant women emphasise the dangers to mother and child, yet the incidence of smoking during pregnancy remains high. Pregnancy is identified as a strong teachable moment where behaviour change is more likely, however, advice from primary care clinicians against smoking during pregnancy seems to be having little impact. Is it that pregnant women are immune to the quit message or are smoking cessation interventions not as effective during pregnancy? We need to find better ways of triggering quit attempts and investigate the efficacy of current smoking cessation interventions for pregnant women.

Key Words

Pregnancy; smoking cessation; teachable moment; intervention; abstinence

INTRODUCTION

Despite Australian public health campaigns highlighting the risks of smoking during pregnancy, one in nine women who gave birth in 2014 smoked at some stage during their pregnancy.¹ The incidence of smoking is higher for certain groups of women such as younger mothers (32 per cent of mothers <20), those living in remote (20 per cent) and very remote areas (34 per cent), mothers living in lower socioeconomic areas (18 per cent), and indigenous mothers (44 per cent).¹ This suggests that either women are not responsive to the quit message during pregnancy, or current smoking cessation strategies are not effective for pregnant women.

Behavioural interventions designed to reduce health risks are predicated on influencing individual choices. The effort required to make different choices is often too great to counteract established habits.^{2,3} In order to effect change, the new behaviour has to be perceived as preferable, possible, and acceptable. Behavioural change is most likely to happen during a teachable moment (TM) when a person is more likely to accept the cost of adopting new behaviour.^{4,5} Three concepts determine if an event is a “teachable moment”: (1) enhanced perception of personal risk; (2) strong emotional response to the event; and (3) new concept of self.⁴

Thus, the ideal teachable moment is one that incites either a positive or negative emotional response that threatens some aspect of a person’s self, or one that causes an adjustment in how the person conceives his/her identity or social role.⁴ In healthcare, pregnancy and diagnosis of a chronic condition have been shown to be effective TMs;⁴ however, unlike the latter, pregnancy is an opportunity to modify behaviour before disease occurs.⁶ Further, pregnancy is thought to be a strong TM based on the premise that the mother’s main focus is protection of her child, as well as the presence of strong social pressure to abstain from smoking during pregnancy.⁴

Current strategies to address smoking cessation for pregnant women in primary care are inconsistent and lack efficacy. Strategies such as brief advice, self-help manuals, and tailored interventions based on stages of change do not significantly affect smoking rates in pregnant women.^{7,8} A survey of general practitioners (GPs) and obstetricians in Australia reported that although 75 per cent of physicians “always” performed the “ask” and “advise” components of the 5As strategy, less than 33 per cent “always” performed the rest of the components of this approach.⁹ Additionally, referral rates to Quitline are low, especially for GPs managing a higher proportion of indigenous patients.⁹ This may be evidence that despite pregnancy being a unique and strong TM, healthcare professionals involved in the care of these women are not successfully maximising the TM to promote smoking cessation. There is scope for additional strategies to maximise the potential advantages of pregnancy as a TM to promote healthy lifestyle interventions.⁹

Evaluation of other smoking cessation strategies for pregnant women have variable results. Proactive telephone support delivered by a professional as an adjunct intervention has been suggested to assist in preventing smoking relapse but has no effect on smoking cessation during pregnancy.¹⁰ Despite having indigenous counsellors available, Quitline has been the least helpful intervention according to indigenous pregnant women and their providers.¹¹ More intensive strategies such as motivational interviewing and cognitive behavioral therapy (CBT) have shown to significantly increase smoking cessation during late pregnancy compared to usual care and less intensive interventions (consistent usual care or partial intervention);⁷ however, there are many barriers that make this option impractical in primary care, including lack of time; lack of training or skills; lack of confidence in the efficacy of the approach; organisational or administrative barriers; and lack of high-quality programs that are acceptable to women and care providers.⁷ More systemic interventions may be required, such as easier, effective, and more acceptable referral pathways to deal with extrinsic barriers such as time constraints. Additionally, more research into the efficacy and acceptability of interventions such as Quitline would also be beneficial. Alternatively, a more intensive and tailored approach needs to be investigated such as specialist cessation clinics.⁹

Pharmacotherapy is considered a first-line approach for smoking cessation in the general population and has shown to be effective.¹² There is limited evidence, however, of the safety of pharmacotherapy in pregnancy and the effect it has on the developing foetus. As a result, current Australian guidelines advise that pharmacotherapy be used as a second-line approach in pregnant women if counselling and self-help approaches are unsuccessful.¹³ A review of Nicotine Replacement Therapy (NRT) reported no difference in symptoms such as headache, skin irritation, dizziness, nausea, heartburn, fatigue, palpitation, reduced sensation, increased morning sickness symptoms, and aggravation of postnatal depression, compared to the placebo groups.¹⁴ Conversely, there was some evidence that positive outcomes such as higher mean birthweight and lower preterm delivery occurred in the NRT group. Stronger evidence is required but current data indicates that NRT in pregnant women is safe and could result in higher mean birth weights and lower rates of preterm delivery.

The pharmacotherapy approach also offered a 1.8 times higher abstinence rate in pregnant women; however, when only high quality studies were included in the meta-analysis, the results were equivocal.¹⁴ Similarly, a systematic review¹⁵ investigating NRT as an adjunct to

behavioural support found that when studies without randomization were excluded, there was no significant difference between the smoking cessation rate for the NRT and the placebo group. The low adherence rate in the treatment group may explain these results and may have occurred because the mothers perceived NRT to be harmful to the foetus. It is also possible that pregnancy leads to increased metabolism of nicotine so the women in these studies may have been receiving sub-therapeutic doses and be more likely to get withdrawal symptoms and resume smoking. It is therefore necessary that factors contributing to low adherence rates be evaluated and strategies to overcome these factors be implemented to achieve higher adherence. Additionally, given that NRT has shown to be safe in pregnancy, further studies including more placebo-controlled trials that test higher doses of NRT in pregnant women may be indicated.

Only one trial involving bupropion¹⁶ has been conducted to date and was successful in pregnant smokers. It must be noted that no trials involving varenicline and electronic nicotine delivery systems (ENDS) have been performed in pregnant women. The World Health Organisation (WHO) advises against pregnant women using ENDS due to concerns about the risks to the foetus, however, these risks are considered less than conventional cigarettes.¹⁷ More research investigating the efficacy and safety of bupropion, varenicline and ENDS in pregnant women are required.

Financial incentives have been shown to be extremely effective in increasing cessation rates in pregnant women. The largest trials undertaken⁶ suggest that 22.5 per cent of women offered incentives stopped smoking compared to routine antenatal care (8.6 per cent). These incentives had to be contingent on validated cessation, and a review¹⁸ indicated that there was no benefits of offering non-contingent payments (fixed payment). Further, it has been shown that despite stopping incentives after pregnancy, abstinence is maintained longer into postpartum.^{6,18} This is in contrast to the general population where long-term effect after ceasing financial incentives have not been as beneficial.¹⁸ This may be evidence that pregnancy offers a TM to implement such an intervention as the mother is primed to protect her child. It should be noted that the smoking cessation rate using incentives is higher than that of pharmaceutical and other behavioural interventions. According to the economic analysis of smoking cessation interventions authorised by the UK's National Institute for Health and Clinical Excellence (NICE), it was estimated that financial incentives produced a net benefit of £2,261 (USD \$3,482) after accounting for the cost of the intervention, which is the highest net cost benefit per intervention.¹⁹ As such, incentives may be an effective

and financially viable intervention to obtaining higher smoking cessation rates in pregnant women.

A pilot study in Australia is currently underway to investigate the efficacy and feasibility of offering financial incentives to pregnant women to motivate them to stop smoking.²⁰ An acceptability survey was conducted amongst pregnant women that attended one antenatal clinic in Australia. Results suggest that the majority of patients (60 per cent) did not agree that financial incentives given to pregnant women to stop smoking was an acceptable idea. Smokers were significantly more likely to agree with the intervention than non-smokers and suggested payment amounts ranging from AUD \$50 to greater than AUD \$1,000 were deemed appropriate to quit smoking. Thirty percent of respondents agreed that the intervention may be effective and 22 per cent were undecided.²¹ Future research is warranted on the efficacy of financial incentives to quit smoking in pregnant women.

Limited studies have shown significant correlation between feedback interventions, including carbon monoxide monitoring or prenatal foetal ultrasound, focusing on the potential effects of smoking on the foetus and increased rates of smoking cessation.²² Patient-held pregnancy pocketbooks containing evidence-based information, screening tools, goal setting, self-monitoring activities, and referral information, have also shown small but significant effect on smoking cessation.²³ Other interventions, including exercise, partner/peer support in addition to counselling, and counselling that included support for partners to quit smoking provided unclear results²² and did not show significant effect. Such interventions do not have any significant risks, may have positive effects on wellbeing, and are generally received well by women.

Smoking in pregnancy is still a significant modifiable risk factor especially in vulnerable populations. Given that pregnancy is seen to be a strong TM, it may offer a valuable opportunity for health promotion. Even though there is a high incidence of primary care clinicians asking pregnant women about their smoking status, there is poor follow-up. Further research needs to assess how we can better trigger quit attempts. Even for those smokers who take the first step, interventions such as brief advice, self-help manuals, referral for telephone support, and interventions based on stages of change are not effective. Extensive counselling sessions proven to have a significant effect on smoking cessation are not practical for the primary care setting and may be the reason these interventions are not well utilised. It is still unclear whether NRT is efficacious in pregnancy, but it is safe and warrants further research in pregnancy.

Financial incentives have shown to be very promising and can be implemented at a population level. Other interventions that need further investigation but are showing promising results are patient-directed pregnancy pocketbooks and feedback interventions. Given that specific populations are identified as high-risk for smoking in pregnancy, interventions may need to be individualised or tailored to a particular sector.

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ACKNOWLEDGEMENTS

The author would like thank Prof Moyez Jiwa and Dr Catherine Krejany.

PEER REVIEW

Not commissioned. Externally peer reviewed.

CONFLICTS OF INTEREST

The authors declare that they have no competing interests.

FUNDING

None

ETHICS COMMITTEE APPROVAL

Not required

