

Brief report

Predictors of Pregnant Quitters' Intention to Return to Smoking Postpartum

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Abstract

Introduction: Although many pregnant women quit smoking, most return to smoking postpartum. Returning to smoking is strongly related to women's stated intention about smoking during pregnancy. We examined factors related to women's intention to return to smoking to improve intervention trials.

Methods: We report cross-sectional baseline data from a randomized controlled trial to prevent postpartum return to smoking. Women ($n = 382$; 98% consent rate) were English-speaking women who smoked at least 100 cigarettes in their lifetimes and at least 5 cigarettes a day prior to becoming pregnant. We fit logistic regression models to test whether women's intention to return to smoking was associated with demographic and smoking factors such as race, parity, and smoker self-identity.

Results: Forty-three percent of women had a strong intention of returning to smoking. Factors independently associated with intending to return to smoking were: stating they did not want to be currently pregnant ($OR = 2.1$, $CI = 1.1$ – 3.9), reporting being abstinent for fewer days ($OR = 0.8$, $CI = 0.7$ – 0.9), being less concerned about the harmful effects of smoking to themselves ($OR = 1.6$, $CI = 0.9$ – 2.8), viewing quit as temporary ($OR = 2.1$, $CI = 1.2$ – 3.6), and self-identifying selves as smokers ($OR = 8.7$, $CI = 5.0$ – 15.2).

Conclusions: Although some factors related to intention to return to smoking were unchangeable, it might be possible to attempt to change women's attribution of why they quit to be more permanent and to have them change their self-identity to be a "nonsmoker" from a "smoker who is not currently smoking." Helping women have stronger intentions to stay quit could promote less return to smoking postpartum.

Introduction

Many women stop smoking while pregnant, which offers an opportunity for women to stop permanently. Unfortunately, up to 90% resume smoking by 12 months postpartum.^{1–3} Many have tested interventions to prevent return to smoking; yet, none has been able to show significant effects in biochemically-validated abstinence at 12 months postpartum.^{4–9} The strongest predictor of women

returning to smoking is their stated intention to return,¹⁰ and intention might be more powerful than the intensive interventions that attempt to prevent return to smoking. Intention predicts return to smoking in another "forced quit" situation, such as among smokers who were incarcerated and recently released.¹¹

Indeed, in our Quit for Two study, women who said they were "not at all likely" or "not very likely" to return to smoking, only 54% returned to smoking.¹² Among those who gave responses

“somewhat likely,” “very likely,” or “extremely likely” to return to smoking (43% of the sample), 76% returned to smoking. Thus, many women knew they were somewhat likely to return to smoking; our intensive intervention and many others’ have been unable to alter those intentions. Qualitative research on women’s intention to sustain smoking abstinence suggests that many women doubt their ability to stay quit, despite intending to do so.¹³

To develop more effective interventions, it is important to understand what differentiates women who have clear intentions of returning to smoking from those who do not intend to return. The aim of this article is to compare women who intend to return to smoking to those who do not on demographic, pregnancy-related, and psychosocial factors.

Methods

Participants

Briefly, we recruited pregnant women from 14 prenatal clinics. Eligibility criteria included: 18 years of age or older, spoke English, were registered for prenatal care, and had a history of smoking, defined as having smoked at least 100 cigarettes in their lifetimes, smoked at least five cigarettes a day prior to becoming pregnant, yet not have smoked in past 30 days (mean = 140, *SD* = 55, range of cessation 30–237 days). We confirmed abstinence via breath samples to assess carbon monoxide.

At two of the clinics, staff reviewed all new obstetric patient charts weekly and mailed women with a history of tobacco a letter from their providers. At all other clinics, nurses introduced the study during their initial obstetric intake process. Nurses asked women who consented to sign a form agreeing to be contacted by our research staff about the study. Study staff contacted these women early in their pregnancies and then again at 28-weeks gestation to reassess eligibility and conduct the baseline survey for women who were eligible and willing to participate. We paid women \$20 for doing the baseline survey.

Predictors of Intention to Returning to Smoking

We included the following demographic, pregnancy, and smoking factors: age, race (Non-White vs. White), education (<high school vs. ≥high school), marital status (married/living as married vs. other), employed (no vs. yes), wantedness of pregnancy (did not currently want to be pregnant vs. other), parity (no previous live births vs. at least one), days abstinent, and nicotine dependence. We calculated days abstinent using woman’s self-reported date that she smoked her last cigarette and the date she was randomized into the study. We assessed degree of dependence the two-item Heaviness of Smoking Index¹⁴ using cigarettes smoked per day and minutes to first cigarette to indicate nicotine dependence (0 = not addicted to 6 = extremely addicted).

We also assessed some psychosocial factors: depressive symptoms, partner smoking, support for quitting, reason for quitting, attributions of their cessation, use of smoking to control weight, and smoker self-identity. We assessed depressive symptoms with the Edinburgh Postnatal Depression Scale (EPDS), a 10-item self-report scale that assesses common depressive feelings during the previous 7 days.¹⁵ We chose the EPDS over traditional depression measures as many of the items (e.g., fatigue, crying) are common symptoms during pregnancy but do not represent depression. The cutoff for clinically meaningful level of depressive symptoms was a score of 12 or greater. Support for quitting was measured by the Partner Interaction

Questionnaire where we created a ratio score of positive to negative support. We assessed an internal reason for quitting with one item, “You were concerned about the bad effects of smoking on your health.” We also assessed attributions for their cessation with two items, the first about whether their quit was “under their control” versus “out of their control” and the other item assessed whether their quit was “permanent” versus “temporary.”¹⁶ We adapted a single item measure of smoker self-image using a semantic differential item with “nonsmoker” as one anchor and “smoker” as the other anchor.¹⁷ The self-image variable was dichotomized for women who stated the nonsmoker anchor versus any report of self-image that was not the anchor of nonsmoker.

Primary Outcome

We assessed intention to return to smoking with a single item measure, “How likely are you to smoke in the first 6 months after baby born?” (1 = not at all likely to smoke to 5 = extremely likely to smoke). Analysis of the predictive strength of this variable indicated that those who stated “Not at all likely” and “Not very likely” were significantly different than those who said “Somewhat likely,” “Very likely,” and “Extremely likely.” Thus, we dichotomized this variable into these two groups.

Analyses

One model was fit to test which factors were potentially related to intention to return to smoking; we used backwards selection with significance level to stay in the model of 0.25. The models included site, demographic, pregnancy, and psychosocial factors. Covariate adjusted odds ratios are presented with 95% confidence intervals. Baseline data were used for these analyses. Analyses were performed using SAS software version 9.2. (SAS Institute, Inc.).

Results

Table 1 gives the demographic characteristics of the sample. We recruited 382 women (consent rate 98%): 41% were Black, 49% had more than a high school education, 50% were married or living with a partner, 62% were not employed for pay, 33% were nulliparous, and 59% had a partner who lived with them and smoked.

Primary Analyses

We found five potential factors associated with intention to resume smoking among the factors (**Table 2**). Among pregnancy and smoking factors, wantedness of pregnancy and length of abstinence were associated with women’s intention to return to smoking. Women who did not want to be pregnant were more likely to report intending to return to smoking (*OR* = 2.1, 95% *CI* = 1.1–3.9). Women who had a longer length of abstinence were less likely to report intending to return to smoking (*OR* = 0.8, 95% *CI* = 0.7–0.9).

Among psychosocial factors, we found three associations. Women who said the reason for their cessation was temporary rather than permanent were more likely to intend to return (*OR* = 2.1, 95% *CI* = 1.2–3.6). Women who stated they were not concerned about bad health effects of smoking to their own health were likely to state they intended to return to smoking compared to women who were concerned (*OR* = 1.6, 95% *CI* = 0.9–2.8). Women who self-identified as anything besides a nonsmoker were more likely to report intending to return to smoking compared to women who identified themselves squarely as a nonsmoker (*OR* = 8.7, 95% *CI* = 5.0–15.2).

Table 1. Participant Characteristics

Characteristics	Total (N = 382)
	Mean (\pm)/%
Age (M, SD)	24.8 (5.1)
Partnered (%)	50
Education (%)	
Less than high school	18
High school/general equivalency diploma	33
Vocational school	7
Some college	33
College graduate or higher	9
Race (%)	
White	48
Black	41
Other	11
Employment (%)	
Full-time	24
Part-time	14
Not employed	62
Site (%)	
Durham	62
Fayetteville	38
First pregnancy (%)	33
Did not want to be pregnant at this time (%)	18
Highly concerned about her health effects (%) ^a	70
Permanent attribution for quitting (%) ^b	43
Under control attribution for quitting (%) ^c	72
Identified as nonsmoker (%) ^d	62
Used smoking to control weight (%)	16
Edinburgh Postnatal Depression Scale (M, SD)	7.3 (5.2)
Partner smokes (%)	59
Partner support for quitting (M, SD)	1.1 (0.5)
Addiction (Heaviness Smoking Index) (M, SD)	1.7 (1.5)
Days abstinent (M, SD)	140.3 (54.9)
Intention to return to smoking (%)	43

^aItem read, "You were concerned about the bad effects of smoking on your health."

^bItem read, "Whether your quit was 'permanent' vs. 'temporary'."

^cItem read, "Whether your quit was 'under their control' vs. 'out of their control'."

^dItem was semantic differential, "Nonsmoker...Smoker."

Table 2. Potential Factors Associated With Probability of Intention to Return to Smoking After Birth of Baby^a

	OR	95% CI	p value
Demographic factors			
Non-White	1.5	0.9–2.6	.11
High school or less	1.5	0.9–2.6	.11
Pregnancy and smoking factors			
Pregnancy not wanted	2.1	1.1–3.9	.03
Days abstinent ^b	0.8	0.7–0.9	.006
Psychosocial factors			
Not concerned about bad effects of smoking on her health	1.6	0.9–2.8	.08
Attribution temporary	2.1	1.2–3.6	.006
Self identifies as smoker	8.7	5.0–15.2	<.001

OR = odds ratio.

^aFactors retained in the model (i.e., those with $p \leq .25$) are reported.

^bOR for each incremental increase of 30 days of abstinence.

Discussion

This is the first examination of correlates among pregnant quitters who explicitly state they intend to return to smoking. The results suggest two potential angles for future interventions. Differences in pregnancy and smoking factors suggest interventions might benefit from over recruiting women who are at higher risk of intending to return to smoking. Women who report not wanting to be pregnant and those who have been abstinent for a shorter time might need more intensive interventions during pregnancy to potentially alter their intentions to stay quit.

Further, interventions might attempt to change some factors that are related to women's intention to return to smoking. For instance, interventions might include specific activities to reframe attributions for cessation during pregnancy from temporary to permanent. Many women are motivated to quit for the baby alone, which is an external, temporary motivator; once this motivator is gone (they deliver), they return to smoking. Previous studies have found that internal motivation and making a permanent attribution are related to successful quitting and long term abstinence.^{18–21} One way to help women reframe their cessation during pregnancy as due to a "permanent" versus "temporary" cause by asking them to state motivations other than the baby.

Also, interventions might help women reframe their identity from smoker to nonsmoker. Many of these women have been quit for 6 months and are using the same coping skills that nonpregnant quitters use; however, they might not gain the confidence that a nonpregnant quitter does as they feel they are doing it just for the baby. Even among nonpregnant quitters, some retain their identity as a smoker as long as 2 years after quitting.²² It is unknown how to shift smoker identity to quitter identity, but perhaps interventions could include a component that asks women what defines a smoker and what defines a nonsmoker and through this discussions, they can realize they are more like nonsmokers than smokers who are "taking a break" from their smoking.

Stotts first characterized pregnant quitters as not "true quitters" and noted that they did not have the cognitive profile that nonpregnant quitters do. Nonpregnant quitters who have planned to quit typically have shifted their beliefs about the positive and negative aspects of smoking or have thought about ways they will handle future temptations. In contrast, pregnant quitters have an external motivator that propels them into cessation without the "cognitive work" that increases chances of sustained abstinence.³ Intervening early in pregnancy to encourage women to deliberately "work through" the cognitive process of quitting could help them truly identify as a "nonsmoker" rather than a "smoker" taking a break from smoking. Shifting identity to that of a nonsmoker might also change their intention to return to smoking. Finally, if women cannot stay smoke free, interventionists can encourage harm reduction by asking women to make their homes smoke free.²³

These results should be interpreted in light of limitations. The results are cross-sectional, and thus, no causal inferences can be made. All women were enrolled in a postpartum relapse prevention trial, and thus, might not resemble pregnant quitters who have not enrolled. Further, there might have been variables related to intention to quit that we did not assess, such as outcome expectations that smoking around babies negatively affects their health and self-efficacy that they can stay quit.

Even with these limitations, this is the first report to attempt to characterize which women have preconceived intentions to return to

smoking postpartum. Although some of these factors are not modifiable, some are, which gives promise for interventions that attempt to prevent the common return to smoking.

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Declaration of Interests

None declared.

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